

International Gas Conference, Sept. 26

AMERICAN GAS ASSOCIATION MONTHLY

Gas Leaders of World Will Meet
in Chicago This Month

Foreign Guests
To Visit American Cities

Natural Gas Men
Meet Sept. 25

Stimulative Effects
Of Gas on Small Trees

Safety Precautions
in Drilling Wells

CARL G. DEUBER

C. F. HUFF

Allocation of Costs of Natural Gas Production
and Pipe Line Companies

R. A. RANSOM



September 1933

2,000 Copies Sold In One Month!

A.G.A. Range Manual

THIS new handbook gives specific working instructions so any fitter can put any range into perfect working order in jig-time.

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Fifty Cents a Copy



A General Committee of the American Gas Association, in collaboration with leading distribution engineers, has extended its cooperation to make the Range Manual complete in every detail. E. R. Rothert, chairman, was assisted in this undertaking by R. M. Conner, H. E. Heil, C. R. Miller, T. J. Perry and C. G. Segeler.

AMERICAN GAS ASSOCIATION
420 Lexington Avenue New York, N. Y.

AMERICAN GAS ASSOCIATION MONTHLY

VOLUME XV

SEPTEMBER, 1933

NUMBER 9

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The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

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Where Gas Leaders of World Will Meet



Stevens Hotel, Chicago, Ill., which will be the scene of the International Gas Conference and Fifteenth Annual Convention of the American Gas Association, September 25-29.

AMERICAN GAS ASSOCIATION MONTHLY

Allyn B. Tunis, Editor

VOLUME XV

SEPTEMBER, 1933

NUMBER 9

Whole Industry Rivets Attention On Chicago Convention

OUR Annual Convention—the International Gas Conference—a World's Fair.

That's enough to focus the attention of the entire gas industry upon Chicago where the International Gas Conference and Fifteenth Annual Convention of the American Gas Association will open Monday, September 25, and continue five days through Friday, September 29.

A program such as is rarely presented to an industry will be unfolded before the assembled delegates and representatives who will come from many parts of the world to participate in the deliberations of this international parley.

The gas industry at home and abroad apparently is entering new stages. Economic developments, legislation and regulation are forcing business into altered positions. The general outlook and various angles of the changing order of things will be discussed by able men who are well qualified to present their subjects.

Frank P. Tarratt, M. Inst., C.E., M. Inst. Gas E. (Newcastle-upon-Tyne) president of The Institution of Gas Engineers, will discuss the gas industry from the British standpoint. A. Baril, of Paris, vice-president of the International Gas Union and past president of the French Technical Gas Association, will submit a paper on

"Present Condition of the French Gas Industry."

"The Purpose of International Collaboration in the Gas Industry," will be described in an address by Dr. Fritz Escher, of Zurich, Switzerland, president of the International Gas Union. Arthur Hewitt, of Toronto, Canada, will paint a word-picture of the American gas industry completing the international summary before the Convention.

Lester Hooker, of Richmond, Virginia, member of the State Corporation Commission and president of the National Association of Railroad and Utilities Commissioners, will speak on utility regulation, while time will be



Arthur Hewitt
President



N. C. McGowen
Vice-President



Howard Bruce
Vice-President



Wm. J. Welsh
Treasurer



Alexander Forward
Managing Director



Frank P. Tarrant, M.Inst.C.E., M.Inst.Gas E. (Newcastle-upon-Tyne) President, The Institution of Gas Engineers; Engineer, Newcastle-upon-Tyne and Gateshead Gas Company

allowed for a full and free discussion of the relation of the gas industry to the National Industrial Recovery Program, to be led by a speaker thoroughly familiar with the situation. The part the American Gas Association is playing in the "New Deal" will be explained by Alexander Forward, of New York, managing director.

Conrad N. Lauer, of Philadelphia, president of the Philadelphia Gas Works Company, who, as chairman of the A. G. A. National Directing Committee of Executives, has been actively engaged in rounding out many of the industry's commercial problems, will have an important message for the Convention. He will speak on "The Industry and the National Industry Recovery Program."

"The Industry's Achievement in Research" will be the subject of a paper to be submitted by F. C. Weber, vice-president of The Brooklyn Union Gas Company.

E. M. Tharp, vice-president of the Ohio Fuel Gas Company, Cleveland,

will speak on "Executive Responsibility for Sales Promotion."

Another paper of special interest which will be presented before the general session will be offered by Dr. Harvey N. Davis, president of the Stevens Institute of Technology, Hoboken, N. J., whose subject will be "What's Our Job?"

Following their attendance at the meeting of the Canadian Gas Association, at Ottawa, a warm welcome

will be extended the foreign visitors when they reach Chicago. They will be officially greeted by Rufus C. Dawes, president of the Century of Progress Exposition, and Mayor E. J. Kelly, while C. E. Paige, of Brooklyn, chairman of the American Gas Association Reception and Arrangements Committee, and the members of his committee have completed most details for extending hospitality to the visitors while they are in America.

Daily Convention Calendar

MONDAY, SEPTEMBER 25

- 9:30 a.m. Meeting, Main Technical and Research Committee, Natural Gas Department, North Ballroom, Hotel Stevens.
- 10:00 a.m. Annual Meeting, Manufacturers' Section, Crystal Ballroom, Blackstone Hotel.
- 11:00 a.m. Annual Convention, Natural Gas Department, North Ballroom, Hotel Stevens.
- 2:00 p.m. Second Session, Natural Gas Department, North Ballroom, Hotel Stevens.

TUESDAY, SEPTEMBER 26

- 10:00 a.m. First General Session, International Gas Conference, Grand Ballroom, Hotel Stevens.
- 2:00 p.m. First Accounting Section Session, South Ballroom, Hotel Stevens.
- 2:00 p.m. First Commercial Section Session, North Ballroom, Hotel Stevens.
- 2:00 p.m. First Industrial Gas Section Session, West Ballroom, Hotel Stevens.
- 2:00 p.m. Publicity & Advertising Section Session, North Assembly Room, Hotel Stevens.
- 2:00 p.m. First Technical Section Session, Crystal Ballroom, Blackstone Hotel.
- 8:45 p.m. President's Reception and Dancing, Grand Ballroom, Hotel Stevens.

WEDNESDAY, SEPTEMBER 27

- 8:30 a.m. Home Service Breakfast, Private Dining Room No. 2, Hotel Stevens.
- 10:00 a.m. Second General Session, Grand Ballroom, Hotel Stevens.
- 1:00 p.m. Ladies' Luncheon, A Century of Progress.
- 2:00 p.m. Second Accounting Section Session, South Ballroom, Hotel Stevens.
- 2:00 p.m. Second Commercial Section Session, North Ballroom, Hotel Stevens.
- 2:00 p.m. Second Industrial Gas Section Session, West Ballroom, Hotel Stevens.
- 2:00 p.m. Second Technical Section Session, Crystal Ballroom, Blackstone Hotel.

THURSDAY, SEPTEMBER 28

- 10:00 a.m. Third General Session, Grand Ballroom, Hotel Stevens.
- 2:00 p.m. Midwest Industrial Gas Sales Council, West Ballroom, Hotel Stevens.
- 2:00 p.m. Third Technical Section Session, Crystal Ballroom, Blackstone Hotel.

A. G. A. Exhibit, Home Planning Hall, A Century of Progress Exposition
Open Daily

Most of the delegates from abroad are expected to arrive in two groups, one organized by the Institution of Gas Engineers, and the other by the *Union Syndicale de L'Industrie du Gaz en France*. Besides the British Institution, Mr. Tarratt, with W. J. Grey and W. M. Carr also will represent the National Gas Council of Great Britain and Ireland; J. D. Smith will represent the Irish Association of Gas Managers.

H. E. Bennett, F. B. Richards, F. J. and F. West, H. J. Toogood, A. H. Lynn, D. B. Parkinson and R. P. Chester will represent the Society of British Gas Industries.

George Braidwood will represent the North British Association of Gas Managers.

Returning from the World Power Conference, at Stockholm, is T. Watanabe, of Tokyo, who is expected to arrive in time to represent the Imperial Gas Association of Japan.

At each of the sectional meetings during the A. G. A. Convention, one or more of the distinguished visitors will speak. To date, invitations have been accepted as follows:

Accounting Section: "Meter Reading and Collecting of Accounts; Describing Methods Employed by the



J. R. W. Alexander, M.A., LL.B., F.C.I.S., F.I.Arb., Barrister-at-Law, London; Secretary, The Institution of Gas Engineers; Member of Council, The International Gas Union

Entertainment Program

FOLLOWING is the entertainment program arranged for the International Gas Conference and Fifteenth Annual Convention of the American Gas Association:

President's Reception

TUESDAY EVENING, SEPTEMBER 26, 1933

At 8:45 P.M. the President's Reception will be held in the Grand Ballroom of the Stevens Hotel. Dancing and entertainment immediately following. Music by Cope Harvey and his orchestra.

Wade Booth, Master of Ceremonies
Margery Maxwell, Prima Donna
Audry and Severin, Feature Dancers
Master Eugene, Juvenile Marimba Soloist
The Four Night Hawks

Ladies' Luncheon

WEDNESDAY AFTERNOON, SEPTEMBER 27, 1933

Ladies' Luncheon will be held in one of the most popular restaurants in the grounds of A Century of Progress Exposition. Complete information regarding the luncheon and other features of entertainment will be included in an envelope to be handed to each lady upon registering.

Golf

The following private country clubs have extended their golfing facilities to our membership during the time of the convention: Briergate Golf Club; Calumet Country Club; Elmhurst Golf Club; Evanston Golf Club; Medinah Country Club; Olympia Fields Country Club, and Wilmette Golf Club.

Complete information and cards of introduction will be obtainable at the Convention Registration Desk, Stevens Hotel, Chicago, as early as Saturday morning, September 23.

Portsmouth Gas Company, England," by Thomas Carmichael, M.I. Mech. E., M. Inst. Gas E., Engineer and General Manager, Portsmouth Gas Company.

Commercial Section: "The Commercial Development of the Gas Industry in Great Britain," by T. P. Ridgley, F.C.I.S., Assoc. Inst. Gas E., Commercial Manager and Secretary, Newcastle-upon-Tyne and Gateshead Gas Company.

Industrial Gas Section: "Watson House—An English Research Centre," by C. A. Masterman, M.A., F.I.C., Chief Technical Officer, The Gas Light and Coke Company, London.

Publicity and Advertising Section: "Publicity and Industry," by A. P. Ryan, B.A., Publicity Manager, The Gas Light and Coke Company, London.

Technical Section: "The Preparation of Coke for the London Market," by F. M. Birks, O.B.E., M.I. Mech. E., M. Inst. Gas E., Mechanical Engineer, The Gas Light and Coke Company, London.

Following are the tentative programs of General Sessions and Sectional meetings:

FIRST GENERAL SESSION

International Gas Conference

TUESDAY, SEPTEMBER 26, 1933

10:00 A.M.

Grand Ballroom—Hotel Stevens

Call to Order

PRESIDENT ARTHUR HEWITT, Toronto, Ontario.

Welcome to Chicago

HON. RUFUS C. DAWES, President, A Century of Progress; HON. E. J. KELLY, Mayor of Chicago.

Presentation of Foreign Delegates

PRESIDENT HEWITT.

(Under this item it is proposed to introduce to the Convention official representative of the delegation from each country.)

Address: The Gas Industry from the British Standpoint

F. P. TARRATT, President, The Institution of Gas Engineers, Newcastle-upon-Tyne, England.

Address: Present Condition of the French Gas Industry

A. BARIL, Vice-President International Gas Union and Past President French Gas Association, Paris, France.

Address: The Purpose of International Collaboration in the Gas Industry

DR. FRITZ ESCHER, President, International Gas Union, Zurich, Switzerland.

Address: The American Gas Industry

PRESIDENT ARTHUR HEWITT, Toronto, Ontario.

SECOND GENERAL SESSION

WEDNESDAY, SEPTEMBER 27, 1933

10:00 A.M.

Grand Ballroom—Hotel Stevens

Treasurer's Report

Report: The Association's Job

ALEXANDER FORWARD, Managing Director.

Election of Officers

Address: Executive Responsibility for Sales Promotion

E. M. THARP, Vice-President, Ohio Fuel Gas Company, Columbus, Ohio.

Address: Industry Planning for Greater Sales

CONRAD N. LAUER, Chairman, National Directing Committee of Executives, Philadelphia, Pa.

Discussion: The Industry and the National Industrial Recovery Program

Conrad N. Lauer

THIRD GENERAL SESSION

THURSDAY, SEPTEMBER 28, 1933

10:00 A.M.

Grand Ballroom—Hotel Stevens

Report of Time and Place Committee

W. CULLEN MORRIS, Chairman, Consolidated Gas Company of New York, New York, N. Y.

Rate Structure Résumé

H. D. HANCOCK, Chairman, H. L. Doherty & Co., New York, N. Y.

Address: The Industry's Achievement in Research

F. C. WEBER, Vice-President, Brooklyn Union Gas Company, Brooklyn, N. Y.

Report of Resolutions Committee

Award of Medals

- (a) Beal Medal
- (b) Charles A. Munroe Award

Address: About Utility Regulation

L. HOOKER, President, National Association of Railroad and Utilities Commissioners, Richmond, Va.

Address: What's Our Job?

DR. HARVEY N. DAVIS, President, Stevens Institute of Technology, Hoboken, N. J.



Dr. Harvey N. Davis

FIRST ACCOUNTING SECTION SESSION

TUESDAY, SEPTEMBER 26, 1933

2:00 P.M.

South Ballroom—Hotel Stevens

Chairman's Opening Remarks

J. M. ROBERTS, The Peoples Gas Light & Coke Co., Chicago, Ill.

Report of Nominating Committee

W. A. DOERING, Chairman, Boston Consolidated Gas Co., Boston, Mass.



Presentation of Customers' Relations Committee

H. A. EHRENMANN, Chairman, Midland United Company, Chicago, Ill.

J. M. Roberts

(a) Improving Customers' Relations Through Bill Investigations

FRANK L. HALLOCK, Chairman, New York, N. Y.

(b) Information on Customers' Orders

J. BARTON, Chairman, Chicago, Ill.

Address:

F. L. DAILY, Cooke, Sullivan & Ricks, Chicago, Ill.

Presentation of General Accounting Committee

M. F. REEDER, Chairman, The Peoples Gas Light & Coke Co., Chicago, Ill.

(a) Internal Auditing Controls

E. R. ROTRAMEL, Chairman, Chicago, Ill.

(b) Preservation and Destruction of Records

F. B. SAUNDERS, Chairman, Pittsburgh, Pa.

(c) Discussion

L. L. DYER, Dallas, Texas.

Presentation of Natural Gas Representatives Committee

F. B. FLAHOME, Chairman, Columbia Gas & Electric Corporation, New York, N. Y.

Address: Meter Reading and Collecting of Accounts

THOMAS CARMICHAEL, Engr. and Genl. Mgr., Portsmouth Gas Company, Portsmouth, England.

SECOND ACCOUNTING SECTION SESSION

WEDNESDAY, SEPTEMBER 27, 1933

2:00 P.M.

South Ballroom—Hotel Stevens

Presentation of Customers' Accounting Committee

H. B. BEARDEN, Chairman, St. Louis, Mo.

Presentation of Accounting Machines Committee

C. E. EBLE, Chairman, Consolidated Gas Co. of New York, New York, N. Y.

(a) "Wrinkles"

P. H. BROWN, Brooklyn, N. Y.

(b) Cost of Printing and Addressing Service Bills

E. F. EMBREE, New Haven, Conn.

(c) Accounting Machine Developments

C. E. EBLE, New York, N. Y.

Presentation of Office Management Committee

H. E. CLIFF, Chairman, Public Service Electric & Gas Co., Newark, N. J.

(a) Commercial Office Work Standards

E. N. KELLER, Philadelphia, Pa.

(b) Standardization of Forms and Printing

P. J. SWEENEY, Chicago, Ill.

Report: Uniform Classification of Accounts Committee

H. M. BRUNDAGE, Chairman, Consolidated Gas Co. of New York, New York, N. Y.

Report: Affiliated Association Representatives Committee

E. B. NUTT, Chairman, Hope Natural Gas Company, Pittsburgh, Pa.

Foreign Delegates

Closing Remarks

J. I. BLANCHFIELD, Brooklyn Union Gas Company, Brooklyn, N. Y.

FIRST COMMERCIAL SECTION SESSION

TUESDAY, SEPTEMBER 26, 1933
2:00 P.M.

North Ballroom—Hotel Stevens

Address of Chairman

WALTER C. BECKJORD, Boston Consolidated Gas Company, Boston, Mass.



W. C. Beckjord

Newcastle-upon-Tyne, England.

Report of Nominating Committee

E. R. ACKER, Chairman, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

Election of Officers

Modernizing the Kitchen—

A Play in six scenes.

Symposium of Short Discussions on Kitchen Modernization

RUTH KLEINMAIER, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.; H. P. J. STEINMETZ, Public Service Electric & Gas Co., Newark, N. J.; HUGH CUTRELL, The Brooklyn Union Gas Company, Brooklyn, N. Y.; BERNARD T. FRANCK, American Light & Traction Company, Chicago, Ill.; F. M. ROSENKRANS, Gas Service Company, Kansas City, Mo.; R. A. MALONY, The Philadelphia Gas Works Co., Philadelphia, Pa.

SECOND COMMERCIAL SECTION SESSION

WEDNESDAY, SEPTEMBER 27, 1933

2:00 P.M.

North Ballroom—Hotel Stevens

Market Surveys for Sales Development

PROF. PHILIP CABOT, Harvard School of Business Administration, Boston, Mass.

Refrigeration

F. M. BANKS, Southern California Gas Company, Los Angeles, Calif.

What Price New Business?

MORSE DELLPLAIN, Northern Indiana Public Service Co., Hammond, Ind.

Capturing Today's Home Heating Market

C. A. NASH, United Light & Power Engineering and Construction Company, Davenport, Iowa.

HOME SERVICE BREAKFAST

WEDNESDAY, SEPTEMBER 27, 1933

8:30 A.M.

Private Dining Room No. 2
Hotel Stevens

(Reservations must be made by 5:00 p.m. Tuesday, September 26, at A.G.A. Registration Desk, Stevens Hotel. Tickets \$1.25.)

Home Service Activities—Group of two-minute talks by home service directors. Led by the Chairman of the Home Service Committee.

RUTH KLEIN-
MAIER, Central
Hudson Gas &
Elec. Corp.,
Poughkeepsie,
N. Y.

Talks: Ten Years of Home Service; Advertising Home Service; Individual Cookery Classes; Trade Dealer Contacts; Kitchen Modernization; Wider Use of Home Service; Cookery Classes for Salesmen; Traveling Kitchens; Theater Cooking Schools.



Ruth Kleinmaier

FIRST INDUSTRIAL GAS SECTION SESSION

TUESDAY, SEPTEMBER 26, 1933

2:00 P.M.

West Ballroom—Hotel Stevens

Address of Chairman

E. L. WILDER,
Utility Management Corporation, New York, N. Y.

Report of Nominating Committee

W. F. MILLER,
Chairman, Public Service Company of Northern Illinois, Chicago, Ill.

Election of Officers

Paper: Changing Aspect in the Competitive Market for Industrial Fuels

H. O. LOEBELL, Combustion Utilities Company, New York, N. Y.

Paper: Possibilities of Using Advertising Featuring Industrial Applications to Hold and Develop the Domestic Load

J. A. MALONE, Consolidated Gas Co. of New York, New York, N. Y.



E. L. Wilder

Paper: Are Industrial Gas Developments Keeping Pace with Our Competitors?

E. D. MILENER, American Gas Association, New York, N. Y.

Note: Discussion on all papers at first session will be held for second session.

SECOND INDUSTRIAL GAS SECTION SESSION

WEDNESDAY, SEPTEMBER 27, 1933

2:00 P.M.

West Ballroom—Hotel Stevens

Address: Watson House—An English Research Centre

C. A. MASTERMAN, Gas Light & Coke Company, London, England.

Discussion of Papers Given at First Session

(a) Mr. Loebell's Paper—

Discussion Leader:
A. A. SCHUETZ, Milwaukee Gas Light Co., Milwaukee, Wis.

(b) Mr. Malone's Paper—

Discussion Leader:
J. F. WEEDON, The Peoples Gas Light & Coke Company, Chicago, Ill.

(c) Mr. Milener's Paper—

Discussion Leader:
W. F. MILLER, Public Service Company of Northern Illinois, Chicago, Ill.

Hotel, Restaurant and Bakery Load

(Competition, Sales Methods and Servicing)

Discussion Leader:
T. J. GALLAGHER, The Peoples Gas Light & Coke Company, Chicago, Ill.

MIDWEST INDUSTRIAL GAS SALES COUNCIL

(Regular Fall Meeting to immediately follow Industrial Gas Section program.)

West Ballroom—Hotel Stevens

THURSDAY, SEPTEMBER 28, 1933

1:30 P.M.

Short Business Session and Announcements

Remarks: Selling Industrial Gas with the Help of the Industrial Gas Magazine

H. O. ANDREW, Editor, Gas Age-Record, New York, N. Y.

Paper: Competitors of Gas

C. GEORGE SEGELE, American Gas Association, New York, N. Y.

Report: Competitive Fuels Committee

A. A. SCHUETZ, Chairman, Milwaukee Gas Light Company, Milwaukee, Wis.

Round Table Discussion

MANUFACTURERS' SECTION

SESSION

GAS APPLIANCES INSTITUTE

MONDAY, SEPTEMBER 25, 1933

10:00 A.M.

Crystal Ballroom—Blackstone Hotel

Report of the Chairman

D. B. STOKES,
Chairman,
 United States
 Pipe and
 Foundry Co.,
 Burlington,
 N. J.

Election of Officers

Address:

FLOYD PAR-
 SONS, *Editor*,
 Gas Age Rec-
 ord, New York,
 N. Y.

Address:

GEORGE E. FRAZER, Frazer and Tor-
 bet, Chicago, Ill.

George W. Bean, the Association's representative in Washington, D. C., will be in attendance at the Convention, and will be registered at the Stevens Hotel, and will be prepared to discuss with our manufacturer and gas company members questions relating to gas fuel in government projects.



D. B. Stokes

PUBLICITY & ADVERTISING SECTION SESSION

TUESDAY, SEPTEMBER 26, 1933

2:30 P.M.

North Assembly Room—Hotel Stevens

Report of the Chairman

JAY BARNES,
 New Orleans
 Public Service
 Inc., New Or-
 leans, La.

A Message from the P. U. A. A.

E. FRANK
 GARDINER,
 President, Pub-
 lic Utilities
 Advertising
 Assn., Chicago,
 Ill.

A. G. A. Advertising - Merchandising Program

C. N. LAUER, *Chairman*, National Di-
 recting Committee of Executives, Phil-
 adelphia, Pa.

Pitfalls of Advertising and Advertis-
 ing Men

GEORGE W. ALLEN, *Sec.-Treas.*, Cana-
 dian Gas Association, Toronto, Can-
 ada.



Jay Barnes

Publicity and Industry in Great Britain

R. P. RYAN, *Gas Light & Coke Com-
 pany*, London, England.

P. T. Barnum Started It

CHARLES W. PERSON, *American Gas
 Association*, New York, N. Y.

Report of Nominating Committee

WILLIAM H. HODGE, *Byllesby Engi-
 neering & Management Corporation*,
 Chicago, Ill.

Election of Officers

FIRST TECHNICAL SECTION SESSION

TUESDAY, SEPTEMBER 26, 1933

2:00 P.M.

Crystal Ballroom—Blackstone Hotel

Remarks of the Chairman

J. A. PERRY,
 The United
 Gas Improve-
 ment Co., Phil-
 adelphia, Pa.

Report of Nomi-
 nating Com-
 mittee

I. K. PECK,
Chairman, Bos-
 ton Consoli-
 dated Gas
 Company, Bos-
 ton, Mass.



J. A. Perry

Paper: The Preparation of Coke for the London Market

F. M. BIRKS, *O.B.E.*, *Mechanical
 Engr.*, *Gas Light & Coke Company*,
 London, England.

Presentation of Foreign Delegates

Review of Developments in Distribu-
 tion

C. A. HARRISON, *Chairman*, *Henry L.
 Doherty & Company*, New York,
 N. Y.

SECOND TECHNICAL SECTION SESSION

WEDNESDAY, SEPTEMBER 27, 1933

2:00 P.M.

Crystal Ballroom—Blackstone Hotel

Review of Developments in Gas Pro-
 duction

P. E. EDDY, *Chairman*, *The Peoples
 Gas Light & Coke Co.*, Chicago, Ill.

Paper: The Gum Problem—Recent
 Developments

F. H. FULWEILER, *The United Gas
 Improvement Co.*, Philadelphia, Pa.

The Development of a Non-Stop
 Pilot Control

E. J. BRADY, *The United Gas Improve-
 ment Co.*, Philadelphia, Pa.

THIRD TECHNICAL SECTION SESSION

THURSDAY, SEPTEMBER 28, 1933

2:00 P.M.

Crystal Ballroom—Blackstone Hotel
 Summary of Activities of the Chemical Committee

E. J. MURPHY, *Chairman*, *Brooklyn
 Union Gas Company*, Brooklyn, N. Y.

Report: Survey of the Gas and Coke
 Making Qualities of American Coals

J. S. HAUG, *United Engrs. and Con-
 structors, Inc.*, Philadelphia, Pa.

Symposium on Purification

Paper: Gas Purification and Ammo-
 nia-Sulphate Manufacture

FRED DENIG, *The Koppers Company*,
 Pittsburgh, Pa.

Paper: Résumé of Liquid Purifica-
 tion and Some Recent Develop-
 ments

A. R. POWELL, *Koppers Research Cor-
 poration*, Pittsburgh, Pa.

New Course Arranged For
 Engineers

THE Extension Division of Brooklyn College, Brooklyn, N. Y., announces that, beginning September 29, it will offer a new course in "The Principles of Electrochemistry and Photochemistry."

This course will consider the principles underlying electrochemical and photochemical processes used in industries, together with methods of manufacturing representative products. The course has been arranged for chemists, engineers, and technical employees, and for teachers of science in the New York City high schools.

Applications for admission and further information may be obtained by addressing Professor Joseph G. Cohen, Director of the Extension Division, Brooklyn College, 383 Pearl Street, Brooklyn, N. Y.

I. R. Bulletin on Capital Stock Tax

THE Bureau of Internal Revenue, United States Treasury Department, has issued a bulletin relating to the Capital Stock Tax under Section 215 of the National Industrial Recovery Act. Copies may be purchased at 5 cents each from the Superintendent of Documents, Washington, D. C.

A Century of Progress in the gas industry is dramatically revealed in Gas Industry Hall at the Chicago World's Fair.

Guests from Abroad Will Visit American Cities

AMONG the foreign visitors who will take part in the International Gas Conference, many of whom will be accompanied by their wives, will be:

J. R. W. Alexander, M.A., LL.B., F.C.I.S., F.I. Arb., Barrister-at-Law; Secretary, The Institution of Gas Engineers; Member of Council, The International Gas Union.

A. Baril, Vice-President of the Union Internationale de l'Industrie du Gaz; Past President of the Association Technique de l'Industrie du Gaz en France; Assistant General Manager of the Societe d'Eclairage, Chauffage et Force Motrice.

R. Wilson Bartlett, J.P., F.S.A.A., Director, The Newport (Mon.) Gas Company.

H. E. Bennet, M.C., Chairman, The Society of British Gas Industries; Director, Alder and Mackay, Limited, London.

M. Bernard, Member of the Committee of the Association Technique de l'Industrie du Gaz en France; Director of the Groupe du Nord des Usines de la Compagnie Continentale du Gaz.

C. D. Birks, Assoc. Inst. Gas E., F.C.S., Senior Partner, Abbott, Birks and Company, London.

F. M. Birks, O.B.E., M.I.Mech.E., M.Inst. Gas E., Mechanical Engineer, The Gas Light and Coke Company, London.

H. E. Bloor, B.Sc., B. Eng., M. Inst. Gas E., Engineer, Manager and Secretary, The York Gas Company.

George Braithwood, M. Inst. Gas E., Engineer and Manager, The Coalbridge Gas Company.

Thomas Carmichael, M.I.Mech.E., M. Inst. Gas E., Member of Council, The Institution of Gas Engineers; Engineer and General Manager, The Portsmouth Gas Company.

Col. W. M. Carr, T.D., M. Inst. Gas E., Vice-President, The Institution of Gas Engineers; Engineer, General Manager and Clerk, Stretford and District Gas Board, Stretford.

Reginald P. Chester, Managing Director, Donald Macpherson and Company, Ltd., Mitcham.

H. F. Cotton, M. Inst. Gas E., Distribution Engineer, Alliance and Dublin Consumers' Gas Company, Dublin.

W. E. Dean, M.I.Mech.E., M. Inst. Gas E., Managing Director and Engineer, Exmouth Gas Company.

Dr. F. J. Dent, B.Sc., Research Chemist, The Institution of Gas Engineers, Leeds.

G. Descours, Member of Council of the Syndicat Professionnel de l'Industrie du Gaz; Managing Director of the Societe Generale des Gaz du Midi.

W. Dieterichs, Assoc. M. Inst. Gas E., Manager, Industrial Workshops and Showrooms, The Gas Light and Coke Company, London.

George Dixon, B. Eng., A.M. Inst. C.E., M. Inst. Gas E., Engineer and Manager, City of Nottingham Gas Department.

Fritz Escher, Dipl. Ing., Hon. M. Inst. Gas E., President, International Gas Union; Direktor, Gaswerk der Stadt Zurich.

Thomas Glover, C.B.E., J.P., M. Inst. C.E., M. Inst. Gas E. (Norwich), Past President, The Institution of Gas Engineers.

T. B. Glover, M.Sc., M. Inst. Gas E., Works Engineer, Primitiva Gas Company of Buenos Aires, Limited.

A. T. Green, F.I.C., F. Inst. P., Assistant Director of Research, British Refractories Research Association, Stoke-on-Trent.

William J. Grey, A.C.A., General Manager and Secretary, Alliance and Dublin Consumers' Gas Company, Dublin.

Alfred Harrison, Editor, "Gas Journal," London.

George Helps, M. Inst. Gas E., Engineer and Manager, Nuneaton Gas Company.

George Helps, Jr., Assistant Engineer and Manager, Nuneaton Gas Company.

H. Hollings, M.Sc., M. Inst. Gas E., Chief Gas Chemist, The Gas Light and Coke Company, London.

C. Holmes Hunt, M.A., Assoc. Inst. Gas E., Solicitor (London). Director, The Colonial Gas Association, Ltd.

R. W. Hunter, M. Inst. Gas E., Station Engineer, The Gas Light and Coke Company, Beckton.

D. F. Irving, A.M. Inst. C.E., M. Inst. Gas E., Engineer and Manager, Leatherhead Gas Company.

T. H. F. Lapthorn, J.P., Chairman, The Portsmouth Gas Company.

A. H. Lynn, M. Inst. Gas E., Managing Director, Gas Chambers and Coke Ovens, Ltd., London.

C. A. Masterman, M.A., F.I.C., Chief Technical Officer, The Gas Light and Coke Company, London.

F. Mitchell, Member of Gas Committee, City of Nottingham Gas Department.

G. Monod, Member of Council of the Syndicat Professionnel de l'Industrie du Gaz; Managing Director of the Compagnie Hydro-Electrique d'Auvergne.

H. W. Moys, B.Sc., A.M. Inst. C.E., Assoc. M. Inst. Gas E., Assistant Engineer, The Gas Light and Coke Company, Staines.

B. R. Parkinson, M.I.Mech.E., Hon. M. Inst. Gas E., Technical Director, Parkinson and Cowan, Limited, London.

D. B. Parkinson, M.A., Assoc. M. Inst. Gas E., Engineer at Chief Office, The British Gas Light Co., Ltd., London.

H. de la Paille, President, Association des Gaziers Belges, Bruxelles.

R. Piaton, Member of Council of the Syndicat Professionnel de l'Industrie du Gaz; Managing Director of the Societe du Gaz et d'Electricite du Sud-Est.

G. Reclus, Treasurer of the Association Technique de l'Industrie du Gaz en France; Chief Engineer of the Service Central des Abonnes de la Societe du Gaz et Paris.

W. B. Reidie, J.P., M. Inst. Gas E., Station Engineer, The Gas Light and Coke Company, Bromley-by-Bow.

F. B. Richards, M.B.E., M. Inst. Gas E., Chairman, Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Limited, London.

R. Seurot, Chief Engineer and Director of the Services Techniques de la Societe du Gaz de Paris.

A. C. Slaughter, Editor, "Gas World," London.

J. D. Smith, J.P., M. Inst. C.E., M. Inst. Gas E., Past President, The Institution of Gas Engineers; Engineer and Manager, Belfast Corporation Gas Department.

E. P. Stevenson, M. Inst. Gas E., Technical Officer, Primitiva Gas Company of Buenos Aires, Limited, London.

E. S. Symonds, B.Sc. (Eng.), M. Inst. Gas E., Engineer, The Imperial Continental Gas Association, London.

Frank P. Tarrant, M. Inst. C.E., M. Inst. Gas E. (Newcastle-upon-Tyne), President, The Institution of Gas Engineers; Engineer, Newcastle-upon-Tyne and Gateshead Gas Company.

H. Stanley Taylor, Chairman, Bath Gas Company.

H. J. Toogood, M. Inst. Gas E., Crowthorne.

T. Watanabe, Director of the Imperial Gas Association; Chief Engineer, Tokyo Gas Company, Ltd.

Fred J. West, C.B.E., Hon. M. Inst. Gas E., Chairman and Managing Director, West's Gas Improvement Company, Ltd. Manchester.

(Continued on page 393)

Natural Gas Convention

In Chicago, September 25



Geo. W. Ratcliffe
September 25 at the Hotel Stevens, Chicago, Ill.

Prior to the first session of the department, a meeting of the Main Technical and Research Committee will be held in the North Ball Room, at the Stevens, starting at 9:30 a.m. At 11 o'clock the first session will be held in the same place at which time the natural gas men will hear important reports and an address on "Taxation As It Relates to Utility Companies," by Paul S. Clapp, of New York, vice-president of the Columbia Gas and Electric Corp. The second and final session will open at 2 p.m.

The annual meeting and dinner of the Executive, Managing and Advisory Committees will take place at 6:30 o'clock that night in the Tower Ball Room, Stevens Hotel.

The tentative program of the Natural Gas Department follows:

FIRST SESSION

MONDAY, SEPTEMBER 25, 1933

9:30 A.M.

North Ball Room—Hotel Stevens

Annual Meeting — Main Technical and Research Committee

(Open Meeting)

H. C. Cooper, *Chairman*
Hope Natural Gas Company, Pittsburgh, Pa.

Natural Gas Department

11:00 A.M.

North Ball Room—Hotel Stevens
Opening Remarks and Chairman's Address

George W. Ratcliffe, *Chairman*
Manufacturers Light and Heat Co.
Pittsburgh, Pa.

Report of Main Technical and Research Committee

H. C. Cooper, *Chairman*
Hope Natural Gas Company
Pittsburgh, Pa.

Report of Nominating Committee and Election of Officers

T. J. Strickler, *Chairman*
Kansas City Gas Company
Kansas City, Mo.

Address: Taxation as It Relates to Utility Companies

Paul S. Clapp
Columbia Gas and Electric Corp.
New York, N. Y.

SECOND SESSION

MONDAY, SEPTEMBER 25, 1933

2:00 P.M.

North Ball Room—Hotel Stevens

Address: Some Legal Problems Peculiar to the Production and Transportation of Natural Gas Arising Out of the Economic Depression

G. J. Neuner
Panhandle Eastern Pipe Line Co.
Kansas City, Mo.

Address: Rate Schedules for Load Building

F. C. Hamilton
Henry L. Doherty & Company
New York, N. Y.

Address: Selling the Value of Natural Gas

E. M. Tharp
Ohio Fuel Gas Company
Columbus, Ohio

Address: The Generation of High Calorific Value Gas as a Substitute for Natural Gas for Emergency and Peak Load Service

Frank Wills
Pacific Gas and Electric Corporation
San Francisco, Calif.

Address: Electrical Protection Method of Arresting Corrosion

Starr Thayer
United Gas Public Service Company
Houston, Texas

Address: Relation Between Gas Reserves Developed and Undeveloped and Market Requirements

J. H. Dunn
Lone Star Gas Company
Dallas, Texas

Closing Remarks and Adjournment

Offers Medal of Honor

THROUGH the generosity of Addison B. Day, a past president, the Pacific Coast Gas Association is offering the "Addison B. Day Medal of Honor" as an annual award to the member of that Association who is judged to have rendered the outstanding individual service in behalf of the gas industry.

The award may be made for distinguished accomplishment in research; invention, operating methods or practices which reduce the cost of production, transmission, or distribution, or which improve products or by-products; increasing the sale of gas, and outstanding sales development work, including advertising and publicity; development of

new uses for gas; improved public or employee relations; promotion of safety; development of improved accounting practices; and new methods in manufacture, finance or rates.

Every member of the Pacific Coast Gas Association is entitled to make application for the medal or to be nominated by his friends or the company employing him. Applications or nominations should be made to the association prior to July 1 of each year. Judges will be the president and vice-president of the association and three members appointed by the president.

Presentation of the Medal will be made at the annual convention.

Now It Can Be Told

ON August 12 the N.R.A. blue eagle was hoisted on the battlements of Association Headquarters in New York, thus ringing down the curtain on one of the most hectic spurts of activity ever witnessed in gas association circles.

Only once before in the history of the A.G.A. was there an experience even faintly reminiscent of the first twelve high-pressure days of August 1933. That was back in 1920. The industry was then forced to fight for its life against a devastating rise in the cost of gas oil. For a period of months the going was rough and the pace was fast, but at no time did the momentum attain a feverish state of rush.

It was quite the opposite, however, these twelve eventful days of August 1933. With blue eagles to the right of him, and blue eagles to the left of him, and nary a blue eagle of his own, the gas man just had to have one, and he had to have it pronto. The time element being all important, codes of fair competition had to be whipped into shape with all possible dispatch. The ensuing hustle and bustle, stress and strain were thus packed into twelve grueling days and nights, the scene shifting frequently from New York to Washington and back again to New York. In the meantime, the weather conspired with the devil to produce a wave of torrid heat that tested to the limit the capacity of the human constitution to endure punishment.

Out of this fast and furious drive came the needed codes and permission to use the blue eagle. Looking back upon the busy scene from the comparative calm of today one is again impressed with the fact that when a national emergency arises, the members of the gas industry promptly and confidently turn to their Executive Board for advice and leadership.

Upon such occasions it is high-grade performance that counts, and the degree of skill exhibited by the Association in solving a problem of industry-wide import becomes a convenient but exacting yardstick with

which to measure its effectiveness. Thanks to the devoted thought and constructive effort that are contributed generously and freely, and oftentimes at great personal inconvenience and sacrifice, by members of the Board and of responsible committees, the association has successfully weathered these periods of severe test, and in so doing has demonstrated its mettle. Here indeed is an example of voluntary cooperative work functioning in its highest and most unselfish form, the welfare of the industry transcending that of the individual. Let us see how it operated in formulating codes of fair competition for the gas industry and their later acceptance by the N.R.A.

Upon the passage of the Reconstruction Act it appeared probable that operating public utilities were not intended to come under the terms of the Act. Very few operating gas companies are engaged in interstate commerce, and their intra-state operations are in almost every case regulated as to rates and service by state commissions or other public authority. Any increase in operating expenses, due to the administration of the Act, cannot be passed along to the consumer by will of the utility because of this regulatory feature.

Besides, there are scarcely any labor conditions in the industry comparable to the situation in other industries which it was the President's

desire to relieve through shortening hours and increasing compensation. The utilities must, to give the public adequate service every day in the year, operate twenty-four hours a day and be ready to meet peak loads. As a result, the decrease in consumption that has occurred during the industrial depression of the past few years has not usually resulted in the laying off of any considerable number of men in operations.

Peak wages and salaries existent in most industries in 1929 were not generally reached in the utility industries so that corresponding reductions have not been made. In other words, the employees of public utilities did not enjoy the high compensation of others and have not suffered as have the employees of other industries; nor have the hours been longer than the necessities of the public service required.

On the other hand, the manufacturers of appliances, all of whom do interstate business, recognized from the beginning that they would come under the terms of the Act and proceeded to organize at once. Meetings of gas appliance manufacturers were held even before Congress had passed the Recovery Act. Manufacturers of equipment and supplies are also generally active in the preparation of codes affecting their particular industries.

Throughout the gas business there was evident from the beginning an intention to cooperate in every feasible manner in the attempted restoration of national industrial prosperity. As the organization for National Recovery proceeded, however, it became apparent that public utilities would be included. Since some natural gas companies are connected with pipe line operations in interstate commerce, they first became active in the preparation of a code through a committee of the Natural Gas Department, composed as follows: R. W. Gallagher, Pres., The East Ohio Gas Co., Cleveland, Chairman; H. O. Caster, H. L. Doherty & Co., New York; H. L. Dickerson,



(Continued on page 366)

Code of Fair Competition for the Gas Operating Utility Industry

PURPOSE

THE declared purpose of this code is to effectuate the policy of Title I of the National Industrial Recovery Act during the period of emergency.

DEFINITION

The American Gas Association affirms that it imposes no inequitable restrictions on its membership and participation in its activities, and it is truly representative as a national association of the Gas Industry of the United States.

The term "employer" as used herein includes every person, firm or corporation engaged as a public utility in producing, and/or transmitting or distributing manufactured and/or mixed gas.

I.

LABOR PROVISIONS—As required by Section 7 (a) of Title I of the National Industrial Recovery Act, the following provisions are conditions of this code:

1. Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection.

2. No employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing or assisting a labor organization of his own choosing; and

3. Employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

II.

CHILD LABOR—After August 31, 1933, no person under sixteen years of age shall be employed, except that persons between fourteen and sixteen years of age may be employed for not to exceed three hours a day and those hours between 7 a.m. and 7 p.m., in such work as will not interfere with hours of day school.

III.

HOURS OF EMPLOYMENT AND WAGES—The following paragraphs in this section III are in substitution for paragraphs 2 to 7, inclusive, of the President's Reemployment Agreement.*

"(A) No employee shall work for more than an average of 40 hours per week during any six weeks' period, except those specified in Paragraph (B).

"(B) Load dispatchers, emergency maintenance and repair employees, gas works production and gas distribution operators, their attendants, crews and helpers, if highly trained and not readily replaceable, whose duties must be continuously performed in order to render the public a safe and continuous service, may be employed not in excess of 48 hours per week so long as other competent employees are not readily available for such work, and in emergencies such employees

may work more than 48 hours per week, but in no case shall the hours worked exceed an average of 48 hours for six consecutive weeks. All employers subject to this code shall proceed with the training of additional employees as rapidly as is consistent with the rendition of safe and continuous service, so that by March 1, 1934, as many employees as possible may be reclassified under the 40 hours per week limitation; and reports shall be made on said date of the extent of such reclassification to the National Recovery Administration.

"(C) The maximum hours fixed in the foregoing paragraphs shall not apply where not more than two persons are employed in communities of less than 2,500 population, which communities are not part of a larger trade area; nor to employees engaged on emergency work; nor to outside salesmen; nor to employees in a managerial, executive, administrative or supervisory capacity, who now receive more than \$35.00 a week. Population for the purposes of this agreement shall be determined by reference to the 1930 Federal Census.

"(D) Employees shall be paid at the rate of:

(1) Not less than \$15 a week in any city of over 500,000 population or in the immediate trade area of such city;

(2) Not less than \$14.50 a week in any city between 250,000 and 500,000 population or in the immediate trade area of such city;

(3) Not less than \$14 a week in any city between 2,500 and 250,000 population or in the immediate trade area of such city, and

(4) In towns of less than 2,500 population all wages shall be increased by not less than 20 per cent, provided that this shall not require wages in excess of \$12 a week.

(5) This paragraph shall apply to all employees, except those covered by the provisions of the following paragraph (E).

"(E) Employees of the classes who on July 1, 1933, were paid on an hourly rate shall be paid not less than 40 cents per hour, unless the hourly rate for the same class of work on July 15, 1929, was less than 40 cents per hour, in which latter case the rate of pay shall not be less than the July 15, 1929, hourly rate of pay and, in any event, shall not be less than 30 cents per hour;

"PROVIDED that learners may be paid not less than 80 per cent of the minimum wage rate provided in the above schedule, but the total number of learners shall not exceed 5 per cent of the total number of employees employed by any employer subject to this Code."

IV.

APPLICATION—If any employer of labor in this industry is also an employer of labor in any other industry, the provisions of this agreement shall apply to and affect only that portion of his business which is included in this industry.

V.

ADMINISTRATION—The American Gas Association is hereby designated the agency for administering, supervising and promoting the performance of the provisions of this code by the members of the manufactured and mixed gas public utility industry. The American Gas Association shall appoint a Recovery Executive Committee to exercise such functions on behalf of the American Gas Association and the facilities and departments of the American Gas Association shall be available to make the administration effective and efficient.

In order to keep the President of the United States and the Administrator informed as to the observance or non-observance of this Code, each employer shall prepare and file with the statistical department of the American Gas Association at such times and in such manner as may be prescribed, statistics covering the number of persons employed, wage rates, earnings, hours of work and such other data or information as the Recovery Executive Committee may from time to time require.

Any employer may participate in this code and in any revisions or additions thereto by signifying his intention and accepting the proper pro rata share of the cost and responsibility of creating and administering it, either by becoming a member of the American Gas Association or by paying to it an amount equal to the dues from time to time provided to be paid by a member in like situation of the American Gas Association.

VI.

AMENDMENTS—Such of the provisions of this code as are not required to be included therein by the National Industrial Recovery Act may, with the approval of the President, be modified or eliminated as changes and circumstances or experience may indicate.

This code shall become effective when approved.

August 11, 1933.

AMERICAN GAS ASSOCIATION

By Alexander Forward
Managing Director
420 Lexington Avenue
New York City, N. Y.

Kurwin R. Boyes, Secretary

Gas Companies desiring to subscribe to the Code should sign the President's Reemployment Agreement writing in above the signature the following clause:

"To the extent of N. R. A. consent, as announced, we have complied with the President's Agreement by complying with the substituted provisions of Code submitted for the Gas Operating Utility Industry."

Sign the Certificate of Compliance in the same manner with the exception written thereon. The President's Reemployment Agreement when thus executed should be sent to the nearest regional office of the Department of Commerce, and the Certificate of Compliance, as signed with the exception, should be delivered to the Postmaster, whereupon the Blue Eagle Emblem and other material will be delivered and may be used.

* Substitution Approved August 11, 1933, by National Recovery Administration.

Code of Fair Competition for the Natural Gas Industry

PURPOSES

THE declared purpose of this code is to effectuate the policy of Title I of the National Industrial Recovery Act during the period of emergency.

DEFINITION

The Natural Gas Division of the American Gas Association affirms that it imposes no inequitable restrictions on its membership and participation in its activities, and it is truly representative as a national association of the natural gas industry.

The term "employer" as used herein includes every person, firm or corporation engaged in the production, transmission and/or distribution of natural gas for domestic, commercial and/or industrial consumption.

The term "employee," as used herein, shall include all persons employed in the conduct of such operations.

I.

LABOR PROVISIONS—As required by Section 7 (a) of Title I of the National Industrial Recovery Act, the following provisions are conditions of this code:

1. Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection.

2. No employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing or assisting a labor organization of his own choosing; and

3. Employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

II.

CHILD LABOR—After August 31, 1933, no person under sixteen years of age shall be employed, except that persons between fourteen and sixteen years of age may be employed for not to exceed three hours a day and those hours between 7:00 a.m. and 7:00 p.m., in such work as will not interfere with hours of day school.

III.

HOURS OF EMPLOYMENT AND WAGES—The following paragraphs in this section III are in substitution for paragraphs 2 to 7, inclusive, of the President's Reemployment Agreement:²

"(A) No employee shall work for more than an average of 40 hours per week during any six weeks' period, except those specified in Paragraph (B).

"(B) Load dispatchers, well operators, station operators, and emergency maintenance and repair employees, their attendants, crews and helpers, if highly trained

² Substitution Approved August 11, 1933, by National Recovery Administration.

and not readily replaceable, whose duties must be continuously performed in order to render the public a safe and continuous service, may be employed not in excess of 48 hours per week, so long as other competent employees are not readily available for such work, and in emergencies such employees may work more than 48 hours per week, but in no case shall the hours worked exceed an average of 48 hours for six consecutive weeks. All employers subject to this code shall proceed with the training of additional employees as rapidly as is consistent with the rendition of safe and continuous service, so that by March 1, 1934, as many employees as possible may be reclassified under the 40 hours per week limitation; and report shall be made on said date of the extent of such reclassification to the National Recovery Administration.

"(C) The maximum hours fixed in the foregoing paragraphs shall not apply where not more than two persons are employed in communities of less than 2,500 population, which communities are not part of a larger trade area; nor to employees engaged on emergency work; nor to outside salesmen; nor to employees in a managerial, executive, administrative or supervisory capacity, who now receive more than \$35 a week. Population for the purposes of this agreement shall be determined by reference to the 1930 Federal Census.

"(D) Employees shall be paid at the rate of:

(1) Not less than \$15 a week in any city of over 500,000 population or in the immediate trade area of such city;

(2) Not less than \$14.50 a week in any city between 250,000 and 500,000 population or in the immediate trade area of such city;

(3) Not less than \$14 a week in any city between 2,500 and 250,000 population or in the immediate trade area of such city, and

(4) In towns of less than 2,500 population all wages shall be increased by not less than 20 per cent, provided that this shall not require wages in excess of \$12 a week.

"(5) This paragraph shall apply to all employees, except those covered by the provisions of the following paragraph (E).

"(E) Employees of the classes who on July 1, 1933, were paid on an hourly rate shall be paid not less than 40 cents per hour, unless the hourly rate for the same class of work on July 15, 1929, was less than 40 cents per hour, in which latter case the rate of pay shall not be less than the July 15, 1929, hourly rate of pay and, in any event, shall not be less than 30 cents per hour;

"PROVIDED that learners may be paid not less than 80 per cent of the minimum wage rate provided in the above schedule, but the total number of learners shall not exceed 5 per cent of the total number of employees employed by any employer subject to this Code."

IV.

ADMINISTRATION—The Natural Gas Division of the American Gas Association is hereby designated the agency for administering, supervising and promoting the performance of the provisions of this Code by the members of the nat-

ural gas industry. The Natural Gas Division of the American Gas Association shall appoint a Recovery Executive Committee to exercise such functions on behalf of the Natural Gas Division of the American Gas Association and the facilities and departments of the Natural Gas Division of the American Gas Association shall be available to make the administration effective and efficient.

In order to keep the President of the United States and the Administrator informed as to the observance or non-observance of this Code, each employer shall prepare and file with the statistical department of the Natural Gas Division of the American Gas Association at such times and in such manner as may be prescribed, statistics covering the number of persons employed, wage rates, earnings, hours of work and such other data or information as the Recovery Executive Committee may from time to time require.

Any employer may participate in this Code and in any revisions or additions thereto by accepting the proper pro rata share of the cost and responsibility of creating and administering it, either by becoming a member of the Natural Gas Division of the American Gas Association or by paying an equitable proportion of the administration cost.

V.

AMENDMENTS—Such of the provisions of this Code as are not required to be included therein by the National Industrial Recovery Act, may, with the approval of the President, be modified or eliminated as changes and circumstances or experience may indicate.

This Code shall become effective ten days after date of approval.

August 11, 1933.

**NATIONAL GAS DIVISION,
AMERICAN GAS ASSOCIATION**

By R. W. Gallagher
420 Lexington Avenue
New York, N. Y.

Natural Gas Companies desiring to subscribe to the Code should sign the President's Reemployment Agreement writing in above the signature the following clause:

"To the extent of N. R. A. consent, as announced, we have complied with the President's Agreement by complying with the substituted provisions of Code submitted for the Natural Gas Industry."

Sign the Certificate of Compliance in the same manner with the exception written thereon. The President's Reemployment Agreement when thus executed should be sent to the nearest regional office of the Department of Commerce and the Certificate of Compliance, as signed with the exception, should be delivered to the Postmaster, whereupon the Blue Eagle Emblem and other material will be delivered and may be used.

Now It Can Be Told

(Continued from page 363)

Electric Bond and Share Co., New York; L. E. Fischer, Vice-Pres., North American Light and Power Co., Chicago, and T. B. Gregory, Vice-Pres., Columbia Gas and Electric Corp., New York.

Codes were studied and analyzed at Headquarters and contacts were made in Washington.

All the above was preliminary to the big "putsch" which extended from August 1 to 12. On July 31, New Yorkers came to work in the midst of the greatest heat witnessed in years. The mercury hit 100 and the merciless blast, surcharged with humidity, penetrated into office buildings, a substantial portion of it taking up residence in the board room at Headquarters to bedevil the codifiers, then en-route to New York.

The next day, August 1, the Executive Board met at Headquarters. To this meeting were invited the executives of gas companies not directly represented on the Board; thirty-eight in all were present. Despite the fact that there are no N. R. A. blue eagles in Canada (and no matter how hard he might have wished he could not get one for himself, even on loan), President Hewitt came direct from his vacation to preside.

The business immediately at hand was the preparation of a code. During the deliberations, the N. R. A. campaign opened in Cleveland with a great military parade. For two hours the people lined the streets as the bands played wartime airs, and then they crowded—35,000 of them—in the Public Square while the N. R. A. flag was given to the breeze. The necessity of "getting under the blue eagle," as they say in Washington, was thus made all the more apparent.

After a full discussion, the following committee was appointed to draft a code and report back to a meeting of the Board later in the day: Herman Russell, president, Rochester Gas and Electric Corp., Rochester, N. Y., chairman; H. C. Abell, president, National Power and Light Co., New Orleans; F. C. Freeman, president, Providence Gas

Co.; W. C. Beckjord, vice-president and general manager, Boston Consolidated Gas Co.; H. O. Caster, H. L. Doherty & Co., New York; C. E. Paige, vice-president, The Brooklyn Union Gas Co., Brooklyn; George H. Clifford, Pres., Stone & Webster, New York; Paul Clapp, vice-president, Columbia Gas & Electric Corp., New York; and W. G. Rudd, vice-president, The Peoples Gas Light and Coke Co., Chicago.

All that day and until late in the evening, the committee and the Board struggled with the preparation of a code. Official New York temperature, 95. Temperature in sun, 134. Temperature in board room variously estimated at from 360 to 748, with no dissenters. That night M. L. Sperry, president of the Washington Gas Light Company, and Managing Director Forward left for Washington to advise the N. R. A. that a code was in course of preparation. While they were on the train, early editions of the New York morning newspapers announced 12 deaths and 40 prostrations from the heat.

The next day, August 2, the Board reported for duty again and resumed its work. After most strenuous effort a code was completed, and Messrs. Russell, Beckjord and Rudd were appointed a committee to present it to the administrators in Washington. On the same day, Managing Director Forward notified all gas company members of the Association by telegram from Washington that the Administration had been put on notice that a code would be presented. Official New York temperature, 95. Temperature in sun, 138. Temperature in board room, anyone's guess, but close to 3,000. Twenty-four deaths from the heat and 28 prostrations were recorded in New York that day.

With a code prepared and ready for submission, the situation cleared and everything looked bright, but not for long, however. Once in the midst of the Washington maul it quickly developed that a substantial delay would occur to secure action because of the pressure incident to the presentation of so many industry codes and the necessity for public hearings. To obviate this delay the

committee determined to pursue a course similar to that just taken by the American Bankers Association by proposing to the N. R. A. to substitute paragraphs as to wages and working hours applicable to the gas industry for corresponding paragraphs in the President's Reemployment Agreement or "Blanket Code."

A meeting of the Code Committee was thus called for August 4 in New York to prepare the necessary provisions. This committee labored all day in heat which grew steadily worse, telegrams and long distance telephone calls flooding into Headquarters from all sections of the country. That night the revised code with the substituted paragraphs was ready and was taken to Washington. The next day, August 5, the code was filed with Dudley C. Cates, Deputy Administrator in charge.

Thereupon ensued a vigil of six days' duration. Quarters occupied by the A.G.A. representatives in the Mayflower Hotel were converted into a sweatshop, the top temperatures ranging from 84 to 88 but nobody believing them, inasmuch as Washington thermometers are known to be notorious liars. Radios and fans in the Mayflower are attached to the same plug and it is no fault of the kilowatts that they could not run both at the same time. Readers are at liberty to guess which apparatus had the right of way.

The scene in Washington reminded one of the war draft days of 1917, only this time it was national recovery fever. Officials of the N. R. A. were so swamped with work as to make interviews difficult and decisions greatly delayed. Swarms of representatives of organizations stampeded the already over-crowded hotels. Loaded down with codes they expected to get them through and leave for home on the next train, only to discover a week or two later they either had to take up permanent quarters in a hotel or go to a hospital for nervous diseases. Even the blue eagle hunting party of the A.G.A. was about to rent houses for permanent occupancy before they got through.

During the first few days following August 5, extensive discussions

(Continued on page 393)

Henry C. Abell Retires From Active Business

H. C. ABELL, former president of the American Gas Association, and one of America's foremost utility officials, announced August 22 that he had resigned all offices and directorates in the Electric Bond and Share Company, New York, and would retire from active business.

He has been vice-president of the Electric Bond & Share Company since 1921 and also was president of the National Power and Light Company since its formation in 1925. In addition to these offices, Mr. Abell has relinquished his posts as director of National Power and Light, as vice-president and director of Electric Power and Light Corporation, as director and chairman of the Memphis Power and Light Company and as vice-president and director of the New Orleans Public Service Company.

Among the other companies on whose boards Mr. Abell sat were Arkansas Power and Light Company, Latex Construction Company, of which he was also president; Louisiana Power and Light Company, Mississippi Power and Light Company, Carolina Power and Light Company, Tennessee Power and Light Company, Memphis and Lake View Railway Company and Southern Gas and Fuel Company.

For many years Mr. Abell who lives in New Orleans, La., has been an active supporter of the American Gas Association; was its president 1924-1925 and 1925-1926, and now is serving on its Executive Board. He also served as a director of the American Gas Institute. He has served on many committees of the Association and in many branches of the industry—engineering, accounting, rates, commercial and public relations which have given him a rounded experience enjoyed by few men.

Of American parentage, Mr. Abell was born in Winnipeg, Manitoba, and obtained his preliminary education at St. John's College, that city. He en-

tered the employ of the Canadian Pacific Railway as an apprentice engineer and later was engaged in installing and operating electric light and electric railway plants. After a varied experience in connection with the operation of public utilities he took a course at the Armour Institute of Technology, Chicago, and obtained the degree of B.S. in Electrical Engi-

During the Spanish-American War he served as an engineer on the auxiliary cruiser St. Louis.

At the close of that war he again became identified with the public utility field and has since devoted his entire time to that industry, covering practically all departments in the design, construction and operation of public utilities. For many years he was connected with the undertakings and activities of Emerson McMillin, a well-known pioneer in the development of public utilities as an investment.

Mr. Abell is a member of the American Society of Mechanical Engineers, American Institute of Electrical Engineers and the Engineering Institute of Canada, besides several clubs, Engineers' Club of New York, and the Bankers' Club.

When Mr. Abell terminated his two-year term as president of the Association, he was presented with a silver-mounted gavel, inscribed as follows:

"Presented to Harry Clinton Abell by the Executive Board of the American Gas Association in token of his untiring labors and outstanding accomplishments as president for two years. Atlantic City, New Jersey, October 12, 1926."



Henry C. Abell

neering and later the degree of Electrical Engineer.

In order to augment his practical engineering experience and to become more familiar with the intensive use of steam apparatus, the most efficiently operated at that time, he entered the marine service, first, on the Great Lakes with the Anchor Line, and later in the ocean service. The work undertaken required the qualifications of a regularly licensed marine engineer.

M. S. Binswanger Heads Memphis Natural

M. S. BINSWANGER was elected president of the Memphis Natural Gas Company at the annual meeting of stockholders to succeed O. H. Simonds, who resigned. John J. Klise was elected vice-president and Carl F. Bauman treasurer. The board of directors was reduced from seven to five members. Mr. Binswanger was re-elected to the board. New directors elected were Mr. Klise, Mr. Bauman, John C. Adams and Marshall Eskridge.

There are 26,000 feet of mains carrying gas fuel to every part of the extensive grounds of the greatest of all World Fairs, the Century of Progress Exposition.

Allocation of Costs of Natural Gas Production and Pipe Line Companies

THE "City Gate" rate structures of Natural Gas Pipeline Companies have been undergoing evolutionary changes for some time. In the earlier past the trend was from flat and proportional rates to straight line meter rates. Recently there has been a noticeable departure from the last mentioned rates to a form of rate containing charges based on the maximum demand on plant facilities and the volume of gas purchased. These recent rates have taken several forms but in general recognition is given to the relative change of costs with load factor. Obviously a knowledge of the relation between costs and load factor is of considerable value to the designers of these rates.

The subject of allocating costs of Manufactured Gas Companies and Natural Gas Distributing Companies has had much study and discussion during the past ten years and while the ultimate design of rates may not have been attained there has been much progress in the art. The knowledge gained from such cost allocations has, undoubtedly, been a very valuable aid to the managements of these companies. In contrast, there has been very little written concerning cost allocations for companies producing and transporting natural gas.

An endeavor has here been made to outline in a general way the principles together with some of the problems encountered in the making of cost allocations. Because of the wide range of conditions under which the production and transportation of natural gas occurs it is impractical to promulgate a definite set of rules or procedure for making a cost allocation. However, clarifying of the general principles will make the preparation of a cost allocation much easier in an application to a specific problem.

Fundamental Principles

The fundamental principle underlying a cost allocation is that the

By R. A. Ransom

costs of any given gas company are dependent upon:

1. The number of customers served.
2. The maximum demand during a given period.
3. The volume of gas delivered during the same given period.

It should be borne in mind that the costs referred to above are the total costs of an entire system and not the costs of delivering gas to a particular customer or group of customers. The problem of determining these latter costs is beyond the scope of this paper.

Definitions

Before a cost item may be allocated it is necessary to have clearly in mind the character of the cost elements. The following definitions have been adopted for this purpose:

CUSTOMER COSTS

Customer Costs are those which vary with the number of customers and which are independent of the volume of gas delivered or the maximum rate of delivery.

DEMAND COSTS

Demand Costs are those incurred in order that the necessary commodity, equipment and personnel shall be available and ready to deliver gas to each customer at any and all times to the full extent of customers' maximum requirements or demand commitment.

COMMODITY COSTS

Commodity Costs are those which vary only with the volume of gas delivered.

In distributing companies the customer costs are a large part of the total costs and for this reason they are quite important. Cost allocations may be completely and logically made on the three-part cost basis and many engineers and ac-

countants may prefer to do this. However, in a pipe line company the customers' costs per customer may be quite sizeable as compared with the customer costs of a distributing company but because pipe line companies usually have only a small number of direct customers the total dollars involved are a very small part of the total costs. When this customer situation exists it is often practicable to omit a separate consideration of customer costs.

Allocation of Property

For the purpose of allocating the property between demand and commodity, as well as for use in calculating the Retirement and Depletion Expense, the property included in the company's Rate Base should be set up by accounts. This should include the Working Capital, Organization, Cost, Going Concern Value, and Cost of Financing as well as the Physical property. Examination of these accounts will generally indicate that the expenditures were made usually for the purpose of increasing the companies' production and transmission facilities. The return on the property would be allocated to demand costs. The exceptions to the above consist of the investment in unoperated leaseholds and Working Capital. Generally the Return on Investments in unoperated leaseholds will be allocated to Commodity Costs. The amount of Working Capital required by the company should have some relation to the amount of the company's expenditures, hence the allocation of the return on this item might be made in the manner hereinafter outlined for general administrative expenses.

Allocation of Operating Expenses

It is necessary to give consideration to the effect of certain kinds of minimum agreements. For instance where royalty, purchased gas, and/or rental agreements are made on a

volume basis but include provision for certain minimum payments, it will be necessary to consider two series of cases; one when the minimum is exceeded and the other when it is not exceeded. When the minimums are exceeded the payments are allocated to commodity costs and when only the minimum payments are made, to demand costs.

In preparing a cost allocation it is usual to set down the expense items by accounts and show the allocation of each account. The Uniform Classification of Accounts for Natural Gas Companies adopted by the National Association of Railroad and Utilities Commissioners has been used as a basis for this discussion. Then, with this outline in mind we shall proceed to consider the expense items as they occur in the usual statement.

ALLOCATION OF PRODUCTION SYSTEM OPERATING EXPENSES

- Acct. 750 Superintendence
- Acct. 755 Superintendence Supplies & Expenses
- Acct. 751 Gas Well Labor
- Acct. 756 Gas Well Supplies & Expenses
- Acct. 752 Field Line Labor
- Acct. 757 Field Line Supplies & Expenses
- Acct. 753 Field Regulating & Measuring Station Labor
- Acct. 758 Field Regulating & Measuring Station Supplies & Expenses
- Acct. 754 Other Labor
- Acct. 760 Other Supplies and Expenses

The test of allocating cost to demand or commodity is to determine its relation to load factor. If there is no relation, then the entire amount is considered a demand cost. If the cost item varies directly with load factor, it should be allocated to commodity costs. Where a part of a cost item varies and the other part does not, then the item is divided between demand and commodity costs in the same proportion. The character of gas production operations vary widely and an allocation can be made only from a detailed knowledge of the particular conditions. However, it will generally result that all of

the above items will be allocated to demand costs.

Acct. 759 Production System Rent

Where rents are a fixed sum per year they are usually in lieu of return and reserves for depreciation and depletion on property and for this reason are allocated to Demand Costs. Where rental payments vary with the volume of gas produced or delivered, the variable portion should be allocated to commodity costs.

Acct. 761 Gas Well Royalties

Where Royalties are on a well basis they should be allocated to Demand Costs. If the payment is on a volume of production basis, the cost should be allocated to commodity costs. The effect of minimum obligations should be given consideration as previously mentioned.

Acct. 762 Rental on Unoperated Leases

Generally lease rentals will be allocated 100 per cent to commodity costs. The reason for this, while a little obscure, is that rentals on unoperated leases (as well as return on investment in unoperated leases) represent a cost of holding property for future operations and should be included in the cost at the time the property becomes operative—that is, these rentals (and Return on Investment) should be capitalized. This method of accounting will cause the investment in operated leases to be greater than it would otherwise be, hence the Retirement and Depletion expense on account of leaseholds will be increased. As discussed, later this Retirement and Depletion expense is allocated to commodity costs. It follows then that where Rentals on Unoperated Leases (and Return on Investment in Unoperated Leases) are currently charged to expense they should be allocated to commodity costs in order to obtain the same results by the two methods.

ALLOCATION OF PRODUCTION SYSTEM MAINTENANCE EXPENSES

- Acct. 763 Superintendence of Maintenance
- Acct. 764 Superintendence of Maintenance Supplies & Expenses

Acct. 765 Maintenance of Gas Well Structures

Acct. 767 Maintenance of Gas Well Equipment

Acct. 766 Maintenance of Other Production System Structures

Acct. 771 Maintenance of Other Production Equipment

Acct. 768 Maintenance of Field Line Equipment

Acct. 769 Changing Field Lines

Acct. 770 Maintenance of Field Regulating and Measuring Station Equipment

The character and extent of production maintenance varies so widely that no general rules for its allocation may be formulated. In some fields the amount of maintenance costs depend on the number of wells connected which in turn depend upon the demand. In these cases the maintenance costs should be allocated to Demand Costs. Frequently, the changing of field lines results from the abandonment of gas wells which in turn is generally related to the volume of gas produced. In such cases a part or all of account 769—Changing Field Lines will be allocated to Commodity Costs.

ALLOCATION OF COST OF GAS PURCHASED

- Acct. 772 Natural Gas Purchased from Affiliated Companies
- Acct. 774 Natural Gas Purchased from Others
- Acct. 773 Manufactured Gas Purchased from Affiliated Companies
- Acct. 775 Manufactured Gas Purchased from Others

Throughout the allocation of the cost of purchasing and producing gas it must be borne in mind that while in general the larger part of the gas so obtained will be delivered to customers a part will be used in the company's operations and a part will be "lost and unaccounted-for" gas. If the gas is purchased on a straight line rate of so much per M cu.ft., the cost of the gas delivered to customers would be allocated to commodity costs, the cost of gas used in the company's operation will

be eliminated through account 870—Utilities Natural Gas used in Operations—Credit, while the allocation of the cost of "Lost and Unaccounted-for" gas will depend upon a determination of the relation between its volume and load factor. If the gas is purchased under, say, a two part rate, the demand or fixed part of the costs would be allocated to demand costs while the variable part of the costs would be allocated as indicated above for gas purchased on a straight line rate. Minimum purchase obligations should be given consideration as previously mentioned.

Acct. 776 Purchased Gas Expense

Generally the operating cost of the gas purchasing department will be considered a demand cost. In some cases it may be reasoned that a high load factor will result in a rapid depletion of the gas fields which will make it necessary to secure purchase contracts on additional wells more frequently than would be necessary if the load factor were lower. On this basis a part of the cost may be allocated to commodity costs.

ALLOCATION OF TRANSMISSION SYSTEM OPERATING EXPENSES

Acct. 777 Superintendence

Acct. 782 Superintendence Supplies & Expenses

It is rather difficult to establish a relation between the above accounts and the load factor by means of a detailed analysis. There are, however, two views that represent about the extremes of thought. One view is that there is no relation between load factor and superintendence expenses and that these accounts should be allocated 100 per cent to demand costs. The other view is that there should be some relation between amount of expenditures and the cost of superintendence or supervision of expenditures. If we follow this view, it would seem to be proper to allocate the above accounts between demand and commodity in the same proportion that the total of the accounts over which they exercise supervision is allocated. This same reasoning might be applied to other superintendence accounts such as accounts 750, 755, 763, 764, 789, and 790.

Acct. 778 Compressor Station Labor
Acct. 783 Compressor Station Supplies & Expenses

If we follow rigidly the assumption that the transportation system must be ready to deliver gas at a certain maximum rate at any time, then 100 per cent of Compressor Station Labor must be allocated to demand costs. In practice, however, there are certain months during which high demands are very probable and other months when they are very unlikely so that careful scheduling of operations may permit certain reductions in this cost with a declining load factor. Only a detailed study of the company's operations will reveal the extent of this variation.

The cost of supplies and expenses such as fuel for heating buildings, operation of auxiliary equipment to provide lighting and similar services should be allocated to demand costs. The cost of supplies and expenses such as fuel or power for operating compressors, lubricating oil, etc., which vary with the amount of gas compressed, should be allocated to commodity costs.

It should be noted that the work done in compressing gas is not always directly proportional to the volume of gas handled. In most instances, however, the error involved in so apportioning the variable costs is unimportant.

Acct. 779 Regulating & Measuring Station Labor

Acct. 784 Regulating & Measuring Station Supplies and Expenses

In making a two-part cost allocation these expenses should be allocated 100 per cent to demand costs. Certain parts of these costs concerned with the metering of gas to customers may be allocated to customer costs in making a three-part cost allocation.

Acct. 780 Transmission Line Labor

Acct. 785 Transmission Line Supplies & Expenses

Generally these costs are allocated 100 per cent to demand costs.

Acct. 781 Other Transmission System Labor

Acct. 787 Other Transmission System Supplies and Expenses

The character of these costs are not defined so their allocation will depend upon a detailed analysis.

Acct. 786 Transmission System Rents

The discussion under Account 759 Production System Rents is applicable here.

Acct. 788 Transportation & Compressor Charges Paid Others

Allocation of this cost will depend upon the basis on which payments are made, *i.e.*, whether fixed or variable.

ALLOCATION OF TRANSMISSION SYSTEM MAINTENANCE EXPENSES

Acct. 789 Superintendence of Maintenance

Acct. 790 Superintendence of Maintenance Supplies and Expenses

The discussion under Accounts 777 and 782 is applicable here.

Acct. 791 Maintenance of Compressor Station Structures

Acct. 793 Maintenance of Compressor Station Equipment

Generally the maintenance of compressor station structures will be allocated 100 per cent to demand costs. The maintenance of compressor station equipment will be approximately proportional to number of hours the equipment is operated and should be considered a commodity cost. However, a detailed study may reveal that the maintenance of certain auxiliary equipment does not depend upon the volume of gas compressed and in such event should be allocated to demand costs.

Acct. 792 Maintenance of Other Transmission System Structures

Acct. 794 Maintenance of Transmission Line Equipment

Acct. 795 Maintenance of Regulating & Measuring Station Equipment

Acct. 796 Maintenance of Other Transmission Equipment

Generally these maintenance costs will have very little relation to the volume of gas handled and where this is true should be allocated to Demand Costs. However, any items which vary with the volume handled should be allocated to Commodity Costs.

ALLOCATION OF GENERAL ADMINISTRATIVE EXPENSES

Acct. 849 Management Fees and Expenses

The basis on which payments are made will determine the allocation of this cost, for instance, if the fee be based on volume of sales it would be a commodity cost, if the fee is a fixed sum per year it would be a demand cost, if it is based on revenue or net income its allocation should be made by determining a relation between the load factor and revenue or net income.

Acct. 850 Administrative Salaries

Acct. 851 Other General Office Salaries

Acct. 852 General Office Supplies & Expenses

Acct. 853 General Stationery & Printing

Acct. 854 General Law Expenses

Acct. 855 General Office Rent

Acct. 856 Maintenance of General Structures

Acct. 857 Maintenance of General Office Equipment

Acct. 858 Maintenance of Other General Equipment

Acct. 862 Gas Franchise Requirements

Acct. 863 Regulatory Commission Expense

Acct. 864 Injuries and Damages

Acct. 865 Insurance

Acct. 866 Welfare and Pensions

Acct. 867 Miscellaneous General Administrative Expenses

The theory that general expenses are incurred largely for the purpose of managing operations, directing sales efforts, and for the handling and supervising of the obtaining and spending of money seems to be about the soundest basis we have on which to make an allocation of these costs. Following this theory these costs are allocated to the basic costs in the

same proportion that all the direct costs are allocated.

Acct. 859 General Communication System Labor

Acct. 860 General Communication System Supplies and Expenses

Acct. 861 Maintenance of General Communication System

That part of the above accounts incurred in order to provide communication to the various parts of the system in order to coordinate and facilitate its operation should be allocated to demand costs. Such part of these costs as are incident to general functions of the company should be treated in the manner outlined for general administrative expenses.

Acct. 402-B Taxes

Generally all taxable fixed capital will be allocated to demand investment, hence all ad valorem taxes will be allocated to demand costs. Before allocating other taxes such as those based on revenue or net income the character of the rate structure must be considered. Taxes which are based on the volume of gas produced or sold should be allocated to commodity costs.

Acct. 402-C Retirement and Depletion Expense

This cost will, depending upon conditions, vary from nearly 100 per cent demand cost to nearly 100 per cent commodity cost. Retirement expense of a pipe line which obtains its supply from a gas field in which its gas reserves are sufficient for a large number of years' operations at a high load factor might be considered as practically a constant amount per year regardless of the load factor. Where large reserves are located in several fields the retirement expense of that part of the system which is common to all sources of gas might be considered as a constant amount per year. Whenever a change in load factor will change the rate of retirement of property that part of the expense so affected should be allocated to commodity costs. The effect of load factor on retirement and depletion expense will be most pronounced in the case of leaseholds, wells, and field lines and least pronounced in the case of major lines connected with large reserves.

Generally in the calculation of Retirement and Depletion expense three causes of retirements are given recognition as follows:

1. Physical deterioration of equipment and structure whose use is constant and does not in any way depend upon the volume of gas delivered.
2. Physical deterioration or wearing out of equipment the extent of which depends upon the volume of gas delivered.
3. Retirement of equipment, structures and leaseholds which is primarily due to the depletion of gas fields.

The Retirement and Depletion expense resulting from the first cause should be allocated to Demand Costs while that resulting from the second and third cause should be allocated to Commodity Costs.

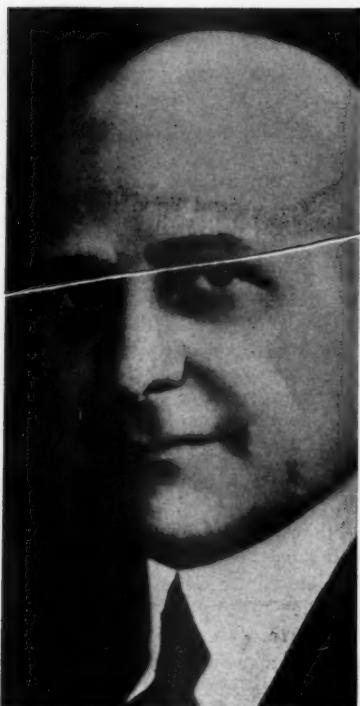
When making cost allocations for rate purposes under long term contracts it may be desirable to base the rate on an estimated cost of producing gas over a number of years. In this case the rate per M cu.ft. at which depletion expense is charged against any one year's operations for rate purposes should be one which it is estimated will be adequate over a period of years. Normally this will require the preparation of long time estimates of the cost of producing gas.

Acct. 411 Rent for Lease of Public Service Property

If the value of leased property has been included in the fixed capital accounts on which a return has been included above, the rental will be eliminated. If not included above, then the rental will be allocated between demand and commodity, the proportions depending upon the basis on which payments are made.

The final result which a two-part cost allocation endeavors to obtain is the relation between costs and load factor. The allocation of costs as obtained from the procedure just outlined will show the costs at one particular load factor; the load factor of the system for the period under study. Care should be used in applying this result since the costs at a particular load factor will not reveal the range through which the

(Continued on page 391)



Henry C. Morris

ONE of its outstanding leaders is lost to the natural gas industry with the death of Henry C. Morris, president of the Dallas Gas Company and a pioneer gas man in the Southwest. He was stricken ill following his return from a trip to Salt Lake City, Utah, and died at Baylor Hospital, in Dallas, on August 17 after an illness of two weeks.

Mr. Morris was known as one of leading natural gas company men in the United States, for many years taking a prominent part in the development of the industry. His advice and counsel were sought by executives of many other companies throughout the country. He was chiefly responsible for bringing to Dallas its present natural gas service, the change over from manufactured gas twenty-three years ago having been accomplished under his direction. Throughout these years he had given unremitting toil to perfecting this service. His work along this line has resulted in Dallas having a greater percentage of homes using natural gas than perhaps any other city in the country.

The handsome, new eleven-story Dallas Gas building the largest build-

Natural Gas Industry Loses Leader When Henry C. Morris Dies

ing in the Southwest devoted exclusively to the natural gas industry, is largely a result of Mr. Morris' activities in making Dallas a center of the natural gas industry in the Southwest.

His activity in the natural gas business included not only the Dallas Gas Company but was national in scope and took in the active direction of a far-flung system of gas companies from Juarez, Mexico to the Pacific Northwest. His supervision included the operations of the Guthrie Gas Service Company, Guthrie, Okla.; the Texas Cities Gas Company, operating in Paris, Brenham, El Paso, Waco, and Galveston; the Fort Worth division of the Lone Star Gas Company; the Juarez Gas Company in Mexico; the Council Bluffs Gas Company in Iowa; and the Northwest Cities Gas Company which includes distribution systems in Walla Walla, Yakima, and Clarkston, Washington; Astoria, Pendleton, and Eugene, Springfield, North Bend, and Marshfield, Oregon, and Lewiston, Idaho.

Mr. Morris always was active and interested in his support of the American Gas Association. At the time of his death he was serving as vice-chairman of the National Directing Committee of Executives, and was a member of the Advisory Council. Formerly he had served as a member of the Executive Board, and as chairman of the Natural Gas Department.

In addition to his efforts in behalf of the utility, he took a keen interest in civic affairs. He was a director of the Dallas Bank and Trust Company, a director of the Dallas Chamber of Commerce, a member of Dallas Athletic Club, the Dallas Country Club, Pentagon Lodge A.F. and A.M. and Hella Temple Shrine, and Senior Warden and member of Diocesan Council of the Church of the Incarnation and former treasurer of that church.

Mr. Morris was born at Detroit, Michigan, in 1879, and educated in public schools of that city. He entered the gas industry in the meter repair shop of the Detroit City Gas Company. Promotions came steadily, and he was made meter shop foreman, then general foreman of street department, and later assistant superintendent of distribution. In 1902 he joined the Saginaw, Michigan Gas Company as superintendent of construction. Three years later he became assistant general manager of the gas company at Bay City, Michigan. In 1909 he went to Dallas, as superintendent of construction and operations of the Dallas Gas Company, and built up the system from 98 miles of pipe line and 8,743 meters to an extensive net work of 765 miles of pipe line serving almost 70,000 meters.

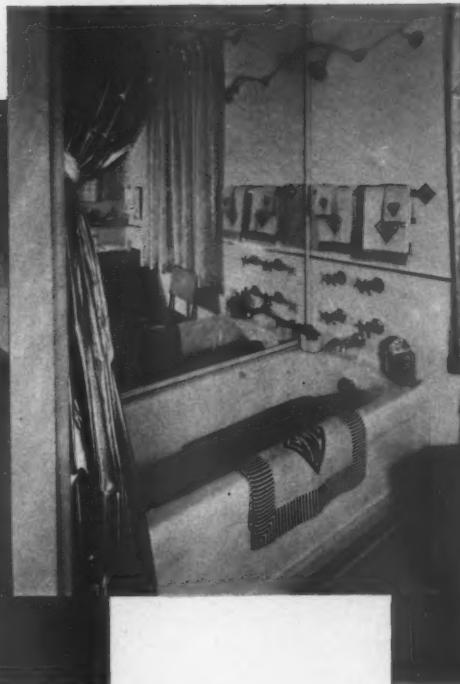
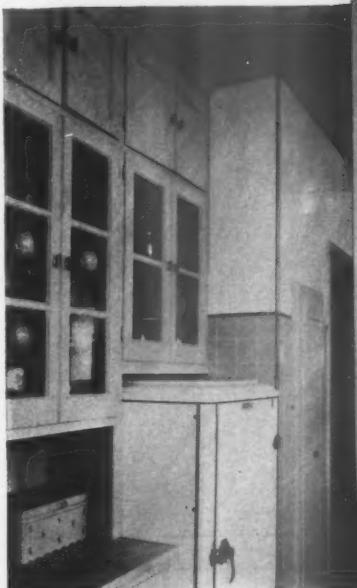
He is survived by his wife, three sons, two brothers and three sisters.

Extend Time for Filing NRA Capital Stock Tax Returns

ON August 24, the Office of the Commissioner of Internal Revenue, at Washington, D. C., announced that the time has been extended for filing capital stock returns under the Industrial Recovery Act, and the payment of the tax for the year ending June 30, 1933, to September 29, 1933. Collectors of Internal Revenue have been authorized to accept returns and taxes filed on or before September 29 without imposing penalties for delinquency.

The All-Gas Masonite Home At Century of Progress Exposition

Color scheme of
bathroom is beige



The graceful stair-
case and hall



Kitchen walls are of
copper-colored bakelite



Two-story living
room with 12-foot
ceiling, and covered
and open sun decks
are important fea-
tures. Cost of house,
exclusive of equip-
ment, \$7,500



Corner of bedroom showing exposed
section of masonite construction

Aluminum fireplace, with drapes and
upholstered pieces in cream and silver

Gas Furnishes Heat, Light and Power In Big Office Building

By J. B. Nealey

A N innovation in modern architecture, one that will be common in a few years, is that of a huge office building with no electric wires running into it, although it uses as much electricity as any other office building of the same size. In the place of the usual electric wires is substituted a pipe line transmitting gas, the universal fuel. This is the new thirteen-story office building of the Dallas Gas Company, Dallas, Texas, which covers half a city block and will eventually rise to twenty-two stories.

Gas supplies heat, light, power, refrigeration, air conditioning, etc., and is also employed as the culinary fuel in the restaurant. Furthermore these services are extended to the ten-story building next door. Electric power is generated by three synchronous generators directly connected to three gas engines of 165 horsepower each. These engines are of the heavy duty, four cylinder type, similar in operation to

the common automobile engine except that they are many times larger, operate at slow speed (277 r.p.m.) and utilize gas instead of gasoline. The electric current generated is 220 volts, 60 cycle, three phase, A. C. with a fourth wire neutral take-off to provide a lighting current without the use of a transformer.

The hot products of combustion from these three engines are used in a heat exchanger, of the tubular type, to heat water, which in turn is used in the wash rooms throughout the building. Usually only two of these engines are ordinarily employed, the other being kept as a standby unit only. Refrigeration is accomplished with an ammonia compressor, directly connected to a forty horsepower gas engine operating at 900 r.p.m. These engines are all water cooled and motor driven pumps circulate this water through cooling towers.

The electricity is employed in the ordinary uses throughout the building as for lighting and operating motors, for the elevators, pumps, laundry, kitchen, machine shop, fans, etc.

The steam for heating the building is low pressure and supplied by two horizontal tubular type boilers, fired with gas burners. These boilers are continuous and automatic in operation, requiring no attention whatever. The correct steam pressure is mechanically maintained by means of a small steam pipe running from the boiler to the upper side of a diaphragm. The lower portion of this diaphragm is connected by a stem to a valve in the gas supply line to the burners, and this is kept in the open position by a spring. When the steam pressure rises above that set on the control, it forces the diaphragm and valve stem down, causing the valve to shut off the gas flow. Conversely when the pressure drops, through lack of combustion in the firebox, the spring forces the diaphragm and valve up, thus restor-



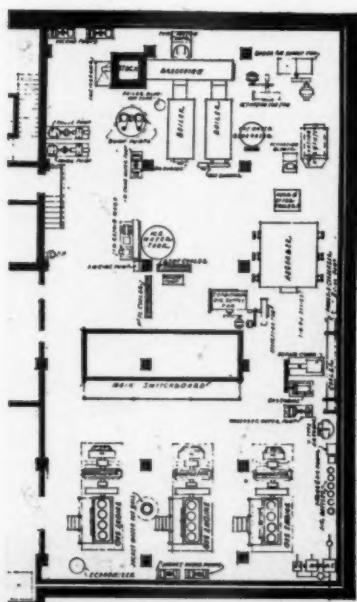
Dallas Gas Company Building, Dallas, Texas—an office building with no electric wires running into it

ing the fuel flow. This same diaphragm causes the dampers to the air intakes of the furnace and burner to open and shut, synchronously with the gas valve.

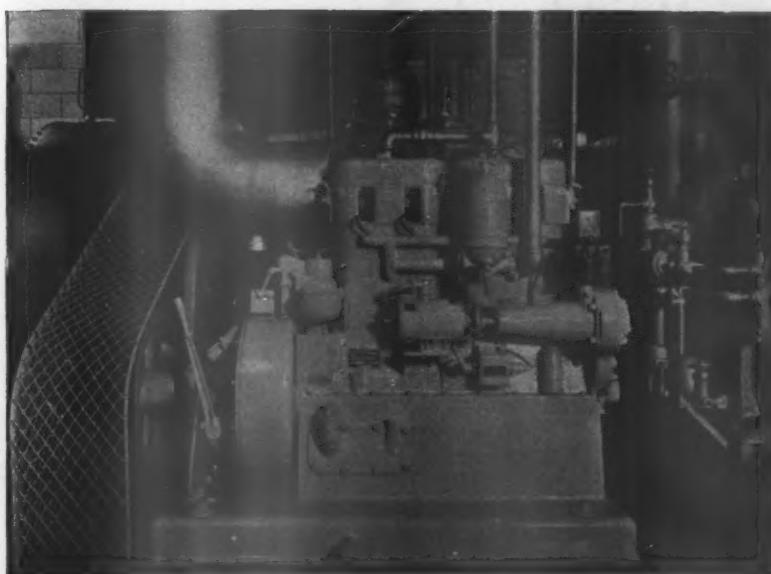
Pressure regulation of the other boiler employs the same kind of diaphragm but utilizes butterfly valves in the gas supply line to the burner. These valves are automatically opened and closed by means of chains connecting them with the diaphragm.

A single master control automatically maintains the desired temperature throughout the building by means of a master radiator equipped with thermostat, mercoil switches, etc., by which the volume of steam to the entire radiation system is regulated.

Cooling a building in summer by circulating cold water through a radiation system is a fairly simple problem but "making weather" by cooling and dehydrating air is quite another proposition and one that is attracting the



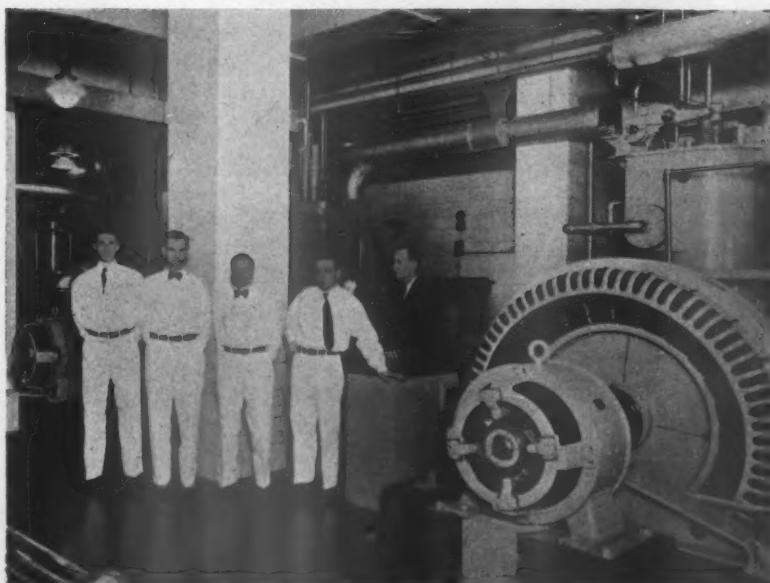
Machinery Room Plan, Dallas Gas Company Building, Dallas, Texas



Fifty horsepower gas engine driving ammonia compressor on air conditioning equipment—Silica-Gel Dehydration unit in background—Dallas Gas Company Building, Dallas, Texas.

attention of engineers and architects all over the country. This installation removes the moisture from the hot, humid air, blends it with untreated air to give it the proper amount of humidity and then cools it for circulation in the giant first floor lobby and basement sales floor.

The dehydration is accomplished in a unit consisting of three beds of the adsorptive material, Silica-Gel. The air is first filtered and is then blown through these beds, one at a time, where the moisture is extracted. It leaves the beds at temperatures in the neighborhood of 115 deg. F and in



Operating crew of engine room, Dallas Gas Company Building, Dallas, Texas. Left to right—J. C. Manning, Jr., G. H. Capps, O. G. Stuart, W. F. Gieb and L. F. Jones, chief engineer

each case is cooled by allowing it to flow through coils circulating water that has been cooled in the towers on the roof. These are known as the intercooler and aftercooler. The adsorption beds are dried out or activated, by forcing hot air through them. This air is heated in a gas-fired heater to 350 deg. F., the heater being constructed of sheet steel, well insulated.

This process is on a progressive time cycle in which two of the beds act as adsorbers while the third is being activated. After a time interval of forty minutes the dampers in the air delivery ducts are automatically reversed so that one of the beds, that has been collecting moisture, is activated in turn, and so on. The hot air employed in activation picks up the moisture from the adsorptive material and is vented to the atmosphere.

This universal fuel is gaining favor as such, at a remarkable rate all over the country. More and more hotels, office buildings, factories, hospitals, theatres, and other commercial buildings are using it for heat, light, power and culinary fuel. Usually it is employed in firing steam boilers, the steam being used to operate turbo-generators or steam engines, as the case may be. The exhaust steam is then used in steam radiation systems for heating the buildings in winter and is vented to the atmosphere in summer after a sufficient amount has been diverted for water heating, laundry, valet service, kitchen, etc.

For comparative purposes let us summarize the two systems. First there is the gas engine, internal combustion, which is directly connected to the generator, compressor, etc., and second there is the boiler utilizing gas heat to raise steam which in turn is employed in engines or turbines operating generators, compressors, etc. In the first case heat from the exhausting products of combustion is partly retrieved in heat exchangers to create steam for water heating with separate gas fired boilers for building heating and which are operated in cold weather only, while in the second, exhaust steam is directly available for these purposes, all the year round. Little is known, at the present time, as to which system is the most economical in the long run, but both do offer economies over other systems.

Kitchens of Many Lands Featured At Chicago Exposition



Above: Early English kitchen of Shakespearian period. Right: Rural Spanish kitchen, with stone floor and whitewashed walls. Below: Typical Dutch kitchen, with brass and copper utensils. The kitchens are on exhibit in the H. J. Heinz display in the Food and Agriculture Building at the Fair

Above: Acadian kitchen of the days of Evangeline. Below: American Colonial kitchen with its great fireplace



Companies Enter Cash Prize Contest To Sell Gas Refrigerators

WHO can sell the most ice cubes? The answer will be known after November when the American Gas Association National Refrigerator Sales Campaign Contest closes. When the story is told, the following cash prizes will be awarded:

First Prize	\$750
Second Prize	500
Third Prize	250

This campaign is sponsored by the Refrigeration Committee, Commercial Section, American Gas Association. It is designed to sustain activity on gas refrigerator sales from July to October, inclusive. In response to an announcement made by Cyrus Barnes, chairman of the Refrigeration Committee, companies began to enroll last month. Those that have not done so, should file their applications with J. W. West, secretary, Refrigeration Committee, Association Headquarters, 420 Lexington Avenue, New York, N. Y.

"The campaign will be based on 'Who can sell the greatest number of ice cubes,'" explained Mr. Barnes. This contest is so arranged that any sales organization, large or small, can participate.

Mr. Barnes continued:

"Through the liberal cooperation of the Electrolux Refrigerator Sales, Inc., we are pleased to offer these substantial prizes. All of the details of awards and rules of the contest are sponsored and executed by the Refrigeration Committee.

"This is a very timely occasion for the members of the American Gas Association to knit themselves into one strong sales triumph. We have a product that is universally accepted. We have a product that is superior to competition. We have a market that is willing to buy—and much of it for cash. We have increased prices hovering in the horizon. We have a willingness on the part of most sales departments to go out and do things that we have not been able to do for a number of years; and we feel that

if everybody can get behind this contest and do things, we will have established a precedent in Gas Association activities never before equalled.

"We feel that the gateway to further Association success is open, and that if we can give it a good push this summer, bigger and better things can be accomplished in the future. Protect that investment of \$250 or more per meter that you have, by putting on the retail house line a product that will bring your customer to greater belief in your Gas Company."

The following rules and regulations have been prepared by the Refrigeration Committee:

1. Time

The contest to run for the months of July, August, September and October inclusive—beginning July 1st and ending October 31st.

2. Who May Enter

Any gas company office, sales district, or sales branch. The idea of this contest is to get as many organizations entering this contest on an even basis as possible.

For example: Public Service Electric and Gas Company of New Jersey should register each one of their district offices as a separate unit.

Philadelphia Gas Works and Brooklyn Union Gas Company may enter the contest as a unit or let each one of their districts enter as a unit, which would be more desirable to the Committee.

3. What Product

While the campaign is primarily for gas refrigerator sales, the contest will be exclusively on Electrolux refrigerators, as the manufacturer is supporting this contest in a liberal way. Any type Electrolux refrigerator may be included . . . Air-Cooled or Water-Cooled.

4. Basis of Entering Reports

Only installations on retail meters installed by companies and their co-operating dealers can be reported in this contest. Such installations can be credited from July 1st.

5. Definition of Retail Meter

In order to clearly define the boundaries of this contest, it must be definitely established that a retail meter is one in any dwelling of four families or less. This restriction has been included in order that the contest may be based on retail sales only.

6. Objective

The objective of this contest is to see which gas company office, district office, or branch office together with its cooperating dealers can sell the greatest number of ice cubes per 100 registered retail meters.

For example: The gas company has registered 60,000 retail meters. During the period of the contest they sell 100 ED-50 Electrolux refrigerators—With 48 ice cubes to each refrigerator, this means a total of 4,800 ice cubes, or 8 ice cubes per 100 registered retail meters.

This means that different size models fall into their relative place. The more 6's or 7's that are sold, the better off is the contestant.

7. Prizes

First Prize—The gas company office, district office, or branch office which sells the greatest number of ice cubes per 100 registered retail meters will receive the first prize of \$750.00 . . . \$200.00 of which is to go to the local manager directly responsible for the sales group that accomplished the record . . . the remaining \$550.00 is to be divided among the salesmen pro rata.

Second Prize—The second prize will be \$500.00 . . . \$150.00 of which is to go to the local manager directly responsible for the sales

group that accomplished the record . . . the remaining \$350.00 is to be divided among the salesmen pro rata.

Third Prize—The third prize will be \$250.00 . . . \$50.00 of which is to go to the local manager directly responsible for the sales group that accomplished the record . . . the remaining \$200.00 is to be divided among the salesmen pro rata. This may include cooperating dealers in the case of each prize.

8. Reports

Only official report forms, as provided by the Committee, will be acceptable to the Committee. They should be mailed to the "Refrigeration Prize Contest Committee, American Gas Association, Graybar Building, New York, N. Y."

9. Closing Date

The final reports must be mailed by midnight of November 15, 1933. We also respectfully request the close cooperation of every registered contestant, by sending in their monthly installations on forms provided by the Committee, as requested.

10. Awards

All awards will be paid not later than December 15, 1933. Should any two contestants be equal for first prize, they will receive the same award and will be classed as first and second prize winners. The third prize will then go to the company next in performance. If any two companies have the same record for second prize, they will receive the same amount—thereby eliminating a third prize. This means that three companies will receive the prizes in any event.

11. How To Enter This Contest

All gas companies wishing to enter this contest must register immediately and give us the name of their company or branch; the number of retail meters under their jurisdiction; the name of the local man directly responsible for sales; and the approximate number of men who will be selling Electrolux refrigerators during this campaign. Cards for registering are enclosed with this

letter. Copies of these rules and additional registration cards can be had on application.

12. Final Note (Warning)

This is a strictly retail sales campaign. In giving us the number of meters under the jurisdiction of the sales office, please bear in mind that only private dwellings, up to and in-

cluding four families, can be included in the list of meters registered.

The rules of the contest are fixed. Any questions concerning the interpretation of these rules should be directed to J. W. West, Secretary, Refrigeration Committee, American Gas Association, 420 Lexington Avenue, New York, N. Y.

Utility Safety Problems Will Be Discussed

AS a feature of the National Safety Congress to be held at Chicago, October 2-6, meetings will be devoted to accident prevention problems of the public utilities.

On Tuesday, October 3, the matter of employee training in safety will be discussed by Dr. Morris S. Viteles, assistant professor of psychology, University of Pennsylvania, and director of personnel research, Philadelphia Electric Company, Philadelphia; Professor S. N. Stevens,

Northwestern University, and F. M. Pepper, general plant employment superintendent, Illinois Bell Telephone Company, Chicago.

On Wednesday, October 4, the physical plant from the safety standpoint will be analysed by such outstanding men as W. R. Smith, assistant chief engineer, United Engineers and Constructors, Inc., Newark, New Jersey; C. R. Beardsley, assistant superintendent of distribution, Brooklyn Edison Company, Brooklyn, New York; and W. A. Buchanan, Appalachian Electric Power Co., Welch, West Virginia.

Italian for Italians Proves Successful



AFTER using window displays with English text in Italian localities of the city, the Boston Consolidated Gas Company, Boston, Mass., discovered that about 60 per cent of the foreign population spoke

little if any English. As an experiment, window displays were lettered in Italian, and the result proved so satisfactory the practice has been continued.

Affiliated Association Activities

Canadian Gas Association

VISITORS representing the British and French gas industries are expected to be among the speakers at the twenty-sixth annual convention of the Canadian Gas Association, which will be held in Ottawa, Ontario, September 18 and 19. "Being the occasion of the visit of the overseas gas engineers," said George W. Allen, secretary-treasurer of the association, "the convention promises to be the best in the history of the organization."

Besides papers which will be submitted by the visitors, the Papers Committee has prepared the following contributions to the program:

"Gas Heated Buildings—Ten Years' Experience in Vancouver," by John Keillor, gas engineer, B. C. Electric Ry. Co., Ltd., Vancouver, B. C.

"Liquid Purification by Otherwise Waste Ammonia," by John D. Price, Superintendent, Montreal Coke & Mfg. Company, Montreal, Que.

"Investigations Conducted by the Fuel Research Laboratories of the Department of Mines, With a View to Assisting the Gas and Coke Industry," by B. F. Haanel and R. A. Strong, Ottawa.

"Sewer and Manhole Explosions," by D. O. Wing, assistant superintendent, mains and services department, Montreal Light, Heat & Power Co.

"Planning and Executing an Industrial Fuel Department," by O. L. Maddux, Industrial Engineer, United Gas & Fuel Co., of Hamilton, Limited.

"Reforming Oil Refinery and Natural Gases," by J. A. Perry, United Gas Improvement Company, Philadelphia, Pa.

Pacific Coast Gas Association

ARRANGEMENTS for the fortieth annual convention of the Pacific Coast Gas Association, which will take place at the Ambassador Hotel, Los Angeles, Calif., September 13-15, have been rapidly advanced by the committee in charge, and indications point to a meeting of interest and profit.

The three-day session will be unbroken by anything calculated to divert from problems under discussion. Sports events and entertainment features have been so planned as not to consume time properly belonging to the business meetings. No registration fee will be charged this year.

With D. L. Scott, Los Angeles Gas and Electric Corp., as general chairman, the Convention Committee is made up of the following members:

Auditing—E. N. Simmons, Los Angeles Gas and Electric Corp.

Entertainment—Clyde H. Potter, Southern Counties Gas Company.

Convention Calendar

September

11-14 American Trade Association Executives
Edgewater Beach Hotel, Chicago, Ill.
11-16 American Chemical Society
Chicago, Ill.
13-15 Pacific Coast Gas Association
Ambassador Hotel, Los Angeles,
Calif.
18-19 Canadian Gas Association
Chateau Laurier Hotel, Ottawa,
Ontario

18-20 American Transit Association
Stevens Hotel, Chicago, Ill.
25-29 International Gas Conference and Fifteenth Annual Convention, American
Gas Association
Stevens Hotel, Chicago, Ill.
25-27 British Commercial Gas Association
Bournemouth, England

October

10-13 National Association of Railroad &
Utilities Commissioners
Cincinnati, Ohio
24-26 American Petroleum Institute
Chicago, Ill.

Hotels—R. R. Blackburn, Southern California Gas Company.

Program—Mr. Scott.

Program Manager—William Maddock, Los Angeles Gas and Electric Corp.

Publicity—Douglas Buckler, Southern California Gas Company.

Registration—W. C. F. West, Los Angeles Gas and Electric Corp.

Sports—A. L. Spring, California Servel Incorporated.

Transportation—J. B. Prewett, Los Angeles Gas and Electric Corp.

Committee on Protection of Lines from Highway Construction—Chairman, E. J. Kallevang; Harold H. Brown, A. G. Carson, E. H. Cotton, D. G. Evans, Grant Ford, W. E. Gundlach, W. E. Kemen, E. H. Nelson, L. G. Barnes, H. P. Siebken.

Women's Committee—Chairman, Lynda Hollenbeck; Erna Burzlaff, Amanda Buscher, Katherine Folsom, Lillian Minch, Eleanore F. Radtke, Margaret Rollins, Alma Schulz, Beulah Smith, Frances Tourtelotte.

Foreign Visitor Calls at A. G. A. Headquarters

MAX SOLLNER, chief manager of the gas works at Innsbrook, Austria, and official representative of the Austrian Gas Association, was a visitor at Association Headquarters on August 14.

Frank R. Coates Joins Ranks of Kentucky Colonels

FRANK R. COATES, head of the oil and natural gas division of Henry L. Doherty and Company, a director of Cities Service Company and former president of the Toledo Edison Company, has been commissioned a colonel on the staff of Governor Ruby Laffoon of Kentucky.

A Century of Progress in the gas industry is dramatically revealed in Gas Industry Hall at the Chicago World's Fair.

The gas industry invites you to make Gas Industry Hall one of your scheduled stops at A Century of Progress Exposition.

Welcome awaits you at Gas Industry Hall at the Century of Progress Exposition.

Wisconsin Utilities Association

Chairman Coffin has, with the approval of the Executive Committee of the Wisconsin Utilities Association, appointed the following members to serve on the General Section Committees for the coming year:

Accident Prevention Committee—Chairman, J. G. Dickinson; C. B. Boulet, W. H. Burke, C. H. Dinsmore, C. H. Hansen, C. E. High, F. W. Huels, E. H. Nelson.

Home Service Committee—Chairman, Ella Liner Lambert; Mrs. V. B. Ellwood, Alice R. Ferguson, Mrs. M. Gergen, Jeanette Mayhew, Zella Patterson.

Insurance Committee—Chairman, O. C. Roehl; Robert Anderson, C. H. Dinsmore, Carl W. Dornbach, L. R. Gresenz, W. H. Mann, F. H. Scholl, W. A. Toellner, A. J. Whitcomb.

Customer Relations Committee—Chairman, Paul Hoffman; C. M. Berry, H. W. Cooper, E. G. Cox, Ralph G. Drew, J. J. Feeney, F. T. Finney, L. N. Gobler, Glenn Harmon, Ralph Piper, Robert I. Swift, H. P. Taylor.

Employee Training Committee—Chairman, C. B. Boulet; E. G. Cox, F. T. Finney, John Gray, Dale Heywood, F. W. Huels, J. G. Lynch, A. H. Nielsen, Fred Ripley, A. F. Tegen.

Stimulative Effects of Gas on Small Trees

THE literature dealing with injuries and death of shade trees by leaks from illuminating gas mains in the soil is fairly extensive. Substantial contributions have been made in Europe as well as in the United States. Mention should be made of the papers by Kny (1871), Lackner (1873), and Späth and Meyer (1873), Shonard (1903), Stone (1906, 1913, 1916), Harvey and Rose (1915), Doubt (1917), Wehner (1918), Priestley (1922), Woffenden & Priestley (1924).

The present paper is an elaboration of an earlier note, Deuber (1932). It particularly records observations of the initial stages of illuminating gas injury to trees with the hope that a careful selection of the facts determined under controlled conditions would make field observations of this widespread physiological problem more conclusive.

Early in this work, unmistakable evidence of the stimulative action of illuminating gas was observed. This aspect of the physiology of illuminating gas effects on plants has been recorded in only a relatively few instances, chiefly by Stone (1913). It has been considered advisable to stress this phase of the general problem. The ulterior motive for emphasizing any early symptom is that the writer considers the incipient stages of gas injury to shade trees more important than the later stages associated with death. When we can recognize a tree in the early stages of being poisoned we will then have an opportunity to apply remedial measures. The ultimate goal is therefore to prevent the yearly loss of established shade trees, frequently of trees that are irreplaceable.

Methods

It was recognized that field work with established trees prevented adequate control of the experimental conditions so laboratory and greenhouse studies were planned with seedling trees growing in pots. Various species were used and will be mentioned subsequently. It was first planned to introduce illuminating gas into the soil about the tree roots but a preliminary experiment with two Norway maple trees, three years old, transplanted to glazed crocks, two gallon capacity, indicated that the responses were likely to be variable and long in being made evident. The responses of tomato plants to illuminating gas were then tested by washing off the soil on the roots, enclosing the roots in 250 cc. wide-mouth bottles and filling the bottles with gas by water displacement. A one-holed cork sealed into the mouth of the bottle with plastic clay gave a simple but effective means for enclosing the root system in a gas atmosphere with the top of the plant in air. Positive

* These analyses are on file in my office and may be referred to by any one desiring this information.

† The details of lenticel hypertrophy and proliferation of tap root cells will be more specifically described in a subsequent paper.

By Carl G. Deuber

Assistant Professor of Plant Physiology
Yale University

epinastic (downward) growth of the petioles of tomato plants so treated occurred within twenty-four hours. This arrangement varied as to the size of the bottle and the gas used was the method employed for observing the responses of tree seedlings when the roots alone were in contact with a gas. Other methods for securing the exposure of buds or of entire plants to various gases will be described later.

The gases used in this investigation were chiefly the commercial illuminating gases supplied to the laboratory outlets by the New Haven Gas Light Company. During the winter period this consisted of a "mixed" gas, 60 per cent coke oven gas and 40 per cent water gas. During the summer period coke oven gas was used. Analyses of these illuminating gases were kindly supplied by W. A. Fitzsimmons, Plant Superintendent of the above company at various times during the course of this investigation.*

The "mixed" gas and the coke oven gas was modified in one respect to which attention may be directed. The method of introducing the gas into a bottle, flask or test tube containing tree roots, stems or buds was to first fill the container with water, invert it under water and bubble the gas into the container thereby displacing the water. In this procedure the gas was briefly washed with tap water. To what extent the gases were modified by this procedure is not known.

Exposure of the Roots of Dormant Trees to Illuminating Gas

In the latter part of February, the roots of ten one-year old dormant red oak (*Quercus borealis* Michx.) and black oak (*Quercus velutina* Lamarck) trees were washed free of soil and the tap root of each tree placed in a 250 cc. bottle which was then filled with "mixed" gas. The roots of six additional trees were enclosed in similar bottles containing air and approximately 50 cc. of water. After subjecting the roots of three trees to the "mixed" gas atmosphere for one day the trees were repotted in soil and replaced in the greenhouse. Two trees were released at two and four day periods and three after eight days. These were then repotted. The controls, those with roots in air, were held two, four and eight days before repotting. Within ten days from the beginning of the experiment a marked swelling of the buds of the trees whose roots had been exposed to "mixed" gas for one and two days was evident. In eighteen days, leaves had unfolded on two of the three trees whose roots had been gassed one day. In twenty-six days, leaves were unfolding from seven of the ten gassed trees, two others had large swollen buds

and one died, due probably to the roots drying out in the period of eight days they were enclosed in the bottle. At this time (twenty-six-day period) one control tree (one whose roots had been sealed in air for eight days) had leaves unfolding, four showed more or less swelling of the buds and one was viable but completely dormant. A comparison of these trees used as controls with other undisturbed oak trees indicated that the renewal of vegetative activity was advanced by the unpotting and enclosure of the roots in small bottles. This observation made it advisable in subsequent work to always run control plants similar to those gassed in order to take into account the shock due to unpotting as well as the influence of the respiratory gas exchange of the roots in this enclosed chamber method for noting the effects of the gaseous treatment.

Foliage development was followed in these trees for the entire growing season. It was found that the trees whose roots were subjected to "mixed" gas for one and two days developed foliage normal in every respect, while the leaves of trees gassed four and eight days, respectively, were undersized.

The results of this experiment revealed that one and two day exposures of the roots of red and black oak trees to less than 200 cc. of "mixed" gas hastened the development of the dormant buds with no apparent injurious effects. Longer exposures, four and eight days, hastened bud development to a lesser extent than the shorter exposures and resulted in the formation of leaves smaller in size than normal. Also, unpotting and enclosing the roots of similar oak trees in 200 cc. of air accelerated bud opening to some extent.

In a second experiment with dormant one-year old red and black oak trees the roots of the trees were exposed to "mixed" gas and air in several concentrations. By volume, the gas concentrations were 10, 20, 40 and 100 per cent. The trees were not repotted in soil as in the previous experiment. The roots were left sealed in the bottles for thirty days, so that the behavior of the roots as well as the tops could be observed.

Within twenty-four hours from the time the roots of one of the trees was enclosed in 100 per cent "mixed" gas enlargement of the lenticels on the tap root was observed. In the course of five days lenticel hypertrophy on the tap roots was evident among most of the trees subjected to the several concentrations of gas but this feature was not apparent on the controls.† Considerable bud enlargement was observed in all the gas treated trees in ten days, the most advanced development being in the buds of trees whose roots were in the 10 per cent gas. Within a month, leaves had unfolded on all of the eight trees whose roots were in "mixed" gas, pure or diluted with air. Three control trees showed no activity in the buds while in the fourth the buds were

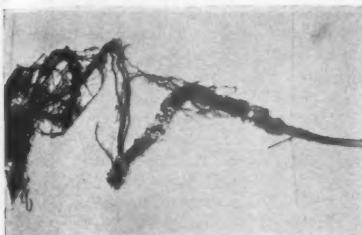


Figure 1

Hypertrophied lenticels on the tap root of a black oak tree. The root was sealed in 125 cc. of "mixed" gas for 30 days. Photographed April 3, 1932

just opening. At this time, the largest leaves were to be found on the trees whose roots were in 100 per cent "mixed" gas.

The influence of the volume of "mixed" gas upon dormant, one-year old red and black oak trees was then investigated. By using Erlenmeyer flasks of 125, 150, 250, 500, 750, 1,000 and 2,000 cc. capacity the roots of two trees were subjected to each of these respective volumes of "mixed" gas. Four trees were set up with their roots sealed in 250 cc. wide-mouth bottles with air to serve as controls. Insufficient water was left in several of these flasks so that some drying out of the upper portions of the tap roots was noticed during the first week, although some hypertrophy of tap root lenticels had taken place. At the end of the week the entire series of flasks was recharged with gas and the control bottles with fresh air and an adequate water supply added. In thirty-five days from the original beginning of the experiment, one of the trees in a 125 cc. flask was in foliage, the second had dried out, and the two in 250 cc. flasks were in leaf, those in the flasks of 500 cc. and larger capacity as well as the controls were still dormant or showed a drying or blackening of the buds. This relatively sharp demarcation of the responses produced by the smaller volumes of "mixed" gas (125 cc. and 250 cc.), stimulation of early development of dormant buds from the responses produced by the larger volumes (500 to 2,000 cc.) causing injury and death was considered particularly interesting. In two months, the three trees with roots in the smaller flasks (125 and 250 cc.) had developed normal leaves 3.5 to 6.0 cm. long and stem elongation growth was proceeding normally. There were numerous intumescences along the tap roots. The two trees with roots in 500 cc. flasks filled with "mixed" gas were dormant and injured. The bark of the stem of one was dry but not wrinkled and no intumescences developed on the roots, the stem of the second tree was not dry and the tap root had numerous intumescences. Practically the same description as the preceding would fit the two trees with roots in 750 cc. flasks, the stem of one was dry and the other not, no intumescences on one but numerous on the second. The trees in the one- and two-liter flasks were dead. The stems of these trees were dry, the bark

deeply wrinkled from the loss of moisture and contraction. It is also of interest to note that a white, filamentous fungus was developing on the surface of these roots but most abundantly on the roots in the one-liter flasks. Evidently the gas in the two-liter flasks inhibited its development somewhat. Of the control trees, one was just unfolding leaves and three were still dormant but viable.

The above experiment was started on March 4, 1932. It was thought desirable to repeat it at an earlier date to see what influence the stage of dormancy had upon the results, so on January 6, 1933, a similar experiment was carried out. Two-year old, dormant red and black oak trees were used. These pot-grown trees had strongly developed but curved roots which made it impossible to fit them in Erlenmeyer flasks and the fibrous roots were much more

important consideration, is that these trees were a year older than in the first experiment. Second, the buds were more dormant, therefore less likely to be injured. Third, the exposures were for a forty-eight-hour period, in the first experiment the roots were left in the flasks throughout. Third, there may have been a variation in the composition of the "mixed" gas. I am inclined to attribute the difference in the results to the age, size of the trees and the greater degree of dormancy as well as to the shorter exposure time in giving stimulative responses without injury.

Exposure of the Roots of Foliaged Trees to Illuminating Gas

During February, 1932, a number of one-year old red and black oak trees were in foliage and growing actively in the greenhouse. These had been forced into active growth by treatment in December with the vapors of ethylene chlorhydrin by methods previously described (Deuber & Bowen, 1930). The washed roots of eight of these trees were sealed in 250 cc. wide-mouth bottles filled with "mixed" gas, two were sealed in similar bottles with air as controls. Two trees were released from the bottles and reported at the end of one, two, three, and seven days, respectively.

During the gas exposure periods of one to seven days a slight wilting of the leaves of the trees occurred but only with one tree (roots held in gas three days) was the wilting of the leaves severe. Five days after the roots of one tree, exposed to gas two days, a marked epinastic (downward) growth of the leaf petioles was observed. This feature was accompanied by a loss of green pigment from the leaf blades and incipient drying of the leaf margins and tissues adjacent to the midrib. The two trees whose roots were gassed three days showed epinastic growth of the leaf petioles. The leaves of one of these trees had lost chloroplast pigments in the region of

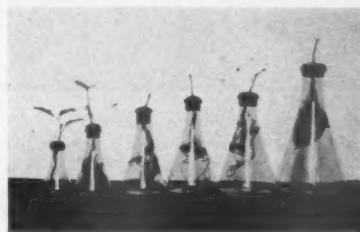


Figure 2

A series of dormant oak trees whose roots had been placed in flasks of 125 cc. to 2 l. capacity and filled with "mixed" gas on March 4, 1932. Photographed April 8, 1932. Foliage developed only on the trees in the 125 and 250 cc. flasks

abundant than on the one-year old trees used the preceding winter. The roots of three trees were placed in 250 cc. wide-mouth bottles, three in 500 cc. bottles and three in one-liter bottles filled with "mixed" gas about the roots. Three trees were sealed with air about the roots in each of these three sizes of bottles to serve as controls. The roots were left in the gas and air atmospheres for forty-eight hours and then repotted in soil and left in the greenhouse. In one week, a marked swelling of the terminal buds of one tree with roots which had been exposed to 500 cc. "mixed" gas was observed. By February 13, thirty-eight days from the beginning of the experiment, every tree whose roots had been subjected to gas had leaves unfolded or unfolding. At this time, one control tree (roots enclosed in 250 cc. of air for forty-eight hours) showed swelling of the terminal buds. It was April 24 before all of the nine control trees had developed leaves. The subsequent growth of the gassed and control trees was normal in every respect.

The fact that only a stimulative response was observed in this experiment when using three volumes of gas in the treatments, while in the preceding both stimulative and toxic effects were noted can be explained in several ways. First, and an im-



Figure 3

Oak trees in foliage when the roots were placed on February 26, 1932, in (left to right) a wide-mouth bottle of 250 cc. capacity and filled with air (control), and in similar bottles filled with "mixed" gas and held for 1, 2, 3 and 7 days, respectively. At the conclusion of these time periods the trees were reported in soil. This photograph, March 9, 1932, shows typical wilting of leaves and the downward growth of the leaf petioles

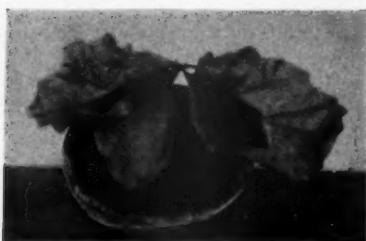


Figure 4

Drying out and blanching of the leaves of an oak tree. The roots of this tree had been sealed in 250 cc. of "mixed" gas for 3 days and then repotted in soil. The basal portions of one-half of the uppermost leaves were only slightly affected. Photographed March 22, 1932, 25 days after the treatment with gas

the midrib and the leaf margins were dry and curling upward.

The pendent leaves of the second tree of this pair were soft and wilted but showed no visible loss of green pigment. Four days after repotting the two trees whose roots were exposed seven days to "mixed" gas the leaf petioles had grown downward and the leaf blades were wilted and drying at the tips.

One month after the roots of these trees had been exposed to gas those exposed one day and the controls were normally foliated but exposures to "mixed" gas of two, three and seven days had produced epinastic growth of the leaf petioles, a drying and a bleaching of more or less large areas of the leaf blades. One tree, gassed three days, had every leaf dried and blanched of all chloroplast pigments, while the second tree of this pair had its leaves dried and blanched except for basal patches of green living tissue. Four days after repotting the trees whose roots were exposed seven days to "mixed" gas the leaf petioles had grown downward and the leaf blades were wilted and drying at the tips.

The physiological responses observed in this experiment with foliated oak tree roots exposed to 250 cc. of "mixed" gas for one to seven days are first, a slight wilting of the leaves, second, epinastic growth of leaf petioles, third, a loss of pigment and drying out of the leaf tip and apical leaf margin and then the tissues adjacent to the midvein proceeding to the base of the leaf which was the last region affected. An exposure of one day did not produce these responses. After three months none of the trees had died. Although the first leaves had largely or entirely dried and blanched and most of the terminal buds were dead these trees produced new leafy shoots from the lower nodes. This experiment gave excellent evidence of the accumulative effects of illuminating gas when taken up by the roots.

Exposure of Dormant Tree Buds to Illuminating Gas and Ethylene Chlorhydrin

It has been shown by Denny & Stanton (1928) that dormancy in the lilac is not systemic but is localized in the buds only. They were able to force one bud of a pair by subjecting just one to the vapors of ethylene chlorhydrin, the untreated bud continued dormant. It was decided to test "mixed" gas as well as ethylene chlorhydrin vapors on the dormant buds of oak and other trees. In February, 1932, the terminal buds of ten dormant red and black oak trees were enclosed in test tubes filled

was one day for two trees and two days for the two other trees. In twenty-five days, the terminal buds exposed to the vapors of ethylene chlorhydrin for one or two days were either dormant or dead. Lateral buds 3 to 6 cm. down the stems were opening at this time. In forty days, these four trees had leafy twigs developed from lateral buds, the terminal buds were inactive or dead. While no comparison of the relative physiological effects of "mixed" gas and the vapors of ethylene chlorhydrin are possible from the limited number of trees involved in these experiments yet it is apparent that the illuminating gas and the chemical vapor both produce stimulative as well as toxic effects on oak buds depending on the time of exposure and concentration.

Exposure of Entire, Potted, Dormant Trees to Illuminating Gas

Since it had been demonstrated that stimulative and toxic effects could be produced in dormant oak trees when the roots or the buds were exposed to illuminating gas it was desirable to know if the exposure of entire potted trees to this gas would hasten bud development and in-



Figure 5

Stimulation of two dormant oak trees (on right) into active foliage development by a 24-hour exposure to 20 per cent "mixed" gas and 80 per cent air in a closed container on March 11, 1932. Photographed April 20, 1932, with two untreated trees on the left

and sealed with approximately 30 cc. of "mixed" gas. The buds of two trees were released from the gas atmosphere after one day, four after two days, and two each after four and eight days. Three trees with buds enclosed in test tubes filled with air as controls were released after four days.

Two weeks from the beginning of the experiment the buds of one of the trees exposed to gas for two days were unfolding leaves and the buds of a tree gassed one day were greatly enlarged. In twenty-five days, leaves 5 to 7 cm. long had developed from the buds gassed one and two days. A lateral bud of one tree with buds gassed four days had opened. A slight enlargement of the buds gassed 8 days was evident but no sign of bud activity was evident in any of the buds of the control trees. Subsequent observations revealed normal foliage development with the trees whose buds were gassed one or two days. The terminal buds gassed four days which had enlarged slightly at first had now darkened and were drying out. Lateral buds lower down the stems had developed small leafy twigs on these trees. The terminal buds gassed eight days were dead and a week development of lateral buds had occurred. After forty days, one of the control trees had leaves just beginning to unfold, while the buds on two others were still dormant.

At the same time as the preceding experiment the terminal buds of four dormant oak trees were sealed in test tubes with one drop of ethylene chlorhydrin on a small piece of cotton. The exposure time



Figure 6

Stimulative and injurious effects simultaneously produced in a honey locust and a catalpa tree. These trees were subjected to the vapors of ethylene chlorhydrin. The buds on the previous season's growth (1931) of the honey locust tree were killed while the buds on the lower portion of the stem (1930 growth) were stimulated into early activity, developing normal leaves. The four terminal nodes of the catalpa tree were killed, the lower buds developed several months in advance of the trees not so treated. Photographed March 11, 1932

cidentally give a practical means for forcing dormant trees or shrubs.

On March 7, 1932, ten potted, dormant, one-year old red and black oak trees and five dormant, two-year old catalpa (*Catalpa speciosa* Warden) trees were placed in a water-sealed, metal container of 100-liters capacity¹ with an atmosphere composed of 20 per cent "mixed" gas and 80 per cent air. The exposure time was two days. Marked swelling of the terminal buds of five of the oak trees was noted within ten days and in twenty days the buds of nine trees were unfolding leaves. The tenth tree unfolded leaves during the following week. Bud activity was slower in starting on the catalpa trees than with the oaks but within twenty-five days, leaves from the five trees were developing. It was not until three or four weeks later that untreated trees developed leaves normally under the greenhouse conditions.

Instead of describing further experiments performed in the late winter of 1931-1932 in which the results were quite similar to the experiment described, it seems desirable to report an experiment of 1932-1933 on this phase of the general problem. A group of forty potted, dormant, two-year old catalpa trees were separated into four uniform lots of ten trees each. One lot was set aside as a control lot. On December 23, 1932, another lot was exposed in the metal container to 100 liters of 20 per cent "mixed" gas for twenty-four hours. On removing these trees from the gassing chamber and airing it, a second lot of these trees was exposed twenty-four hours to 2.5 per cent ethylene in air. On the third day another lot of trees was exposed to the vapors of 10 cc. ethylene chlorhydrin in the 100-liter container for twenty-four hours. The record of the progress of bud development is given in table 1.

TABLE 1

Record of the date and number of trees opening buds and unfolding leaves after a 24-hour treatment with two gases and a chemical vapor on December 23, 24 and 25, 1932.

Date	Days from treatment	Control no treatment	20% "mixed" gas	2.5% ethylene	Vapors from 10 cc. ethylene chlorhydrin
1932-1933					
Dec. 31	7	1	4	3	0
Jan. 5	12	2	6	3	0
" 14	21	3	8	5	4
" 21	28	4	9	6	8
" 28	35	6	10	8	10
Feb. 6	42	6	10	8	10
" 13	49	6	10	9	10
" 20	56	6*	10	10	10

* By April 24 eight trees were in foliage, two were still dormant.

These data indicate that the degree of dormancy in catalpa buds varies rather markedly between individual trees as seen in the record of the control trees. The illuminating gas and ethylene chlorhydrin vapor treatments appear to be slightly better accelerators of bud development of the

roots or some of its buds, and seeds (Deuber, 1933), to a commercial illuminating gas.

This evidence indicates that a commercial illuminating gas is intensely interesting in the variety of physiological responses it may bring forth in young trees. The ultimate explanations for these various phenomena will probably require a long series

of studies involving the testing of the individual components of an illuminating gas as well as deficiencies of components found in air (particularly a higher partial pressure of oxygen) upon large groups of plants. For the time being, the production of these physiological responses under controlled experimental conditions indicate certain features which may be of significance in the diagnosis of shade trees in the process of being injured by gas. The application of the findings in these laboratory studies to field conditions will be discussed in a subsequent paper.

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To Distribute Thiokol in England

Thiokol Corporation, Yardville (Trenton), N. J., announces that through an arrangement just consummated with the Monsanto Chemical Works, Ltd., of London, England, "Thiokol" will be made available for sale and distribution in Europe.

"Thiokol" is the oil-proof, synthetic rubber which, up to the present, has been manufactured solely in the United States and which is being used extensively in many industries.

The Monsanto Chemical Works, Ltd., is allied with the Monsanto Chemical Works of St. Louis, Mo.

¹ Referring to "mixed" gas.

ACCOUNTING SECTION

J. M. ROBERTS, Chairman

H. W. HARTMAN, Secretary

E. B. NUTT, Vice-Chairman

Scheduling Accounting Work To Facilitate Preparation of Monthly Balance Sheet and Income Account

THE essential features of a satisfactory schedule for the monthly closing of the books of account of a gas utility company are (1) the necessity of recording the entire operating revenue and expenses of each month during that particular month, and (2) speed in closing the records. Consequently, it is necessary to have not only the complete cooperation of other departments of the company, especially the Operating Department, but also the assistance of vendors in rendering their monthly invoices promptly.

In order to clarify the procedure explained in this article it will be necessary to give first a brief outline of an Accounting Department organization and second its functions.

Accounting Department Organization

The Accounting Department in most companies is divided into five divisions; namely, Stores, Payroll, Invoice, Calculating and General Accounts.

The Stores Division records the receipt and issuance of all materials and maintains a control on miscellaneous items such as transportation tickets, customers' service installations and repaving.

The Payroll Division prepares all payrolls and the distribution thereof by accounts. The accounting distribution of company and hired trucking is also made by the Payroll Division.

The Invoice Division is responsible for the checking of invoices and the preparation of accounts payable vouchers on all materials, services and similar items which are supported by purchase orders. Accounts payable vouchers for direct charge items which are authorized by means of voucher requisitions instead of by purchase orders may be prepared in this division or in the General Accounts Division.

The Calculating Division is composed of a staff of Calculating Machine operators. It acts as a service division to all branches of the accounting organization and to other departments in the company.

The Stores, Payroll, and Invoice Divisions prepare monthly journal vouchers recording the operations of the company as reported to them, which vouchers are then forwarded to the General Accounts Division to be recorded in the general and subsidiary ledgers.

The General Accounts Division prepares all other journal vouchers. The more important of these may be described as follows:

Gas and other bills to customers,
Income and expense accruals,
Prepayments and deferred charges written off monthly,
Amortization of debt discount and expense,
Distributing overhead expense,
Withdrawals or retirements of fixed capital,
Provision for reserves.

The general ledger is a bound volume in the usual form and is posted by hand. The subsidiary ledgers are loose leaf multiple columnar forms and are operated with bookkeeping machines.

The accounts payable voucher is a two fold form. The first fold is a remittance statement which is forwarded to the creditor with the check, and the second fold is the accounts payable voucher jacket, on the back of which is shown the general ledger and subsidiary ledger distribution of the charges. When the accounts payable vouchers are typed they are registered in the accounts payable voucher register, after which they are audited and the necessary signatures obtained. The remittance statements are then forwarded to the Treasurer's Office and the jackets returned to the bookkeeping typists for posting to the subsidiary ledgers. The accounts payable voucher register serves as a posting medium for the general ledger.

Journal vouchers are loose leaf forms providing for general ledger and subsidiary ledger postings, which are prepared, typed and then reviewed by the chief clerks of the respective divisions. After the necessary approvals are obtained, the journal vouchers are numbered and posted to the general and to the subsidiary ledgers.

Sundry accounts receivable bills are prepared in the General Accounts Division and registered in the accounts receivable register. The subsidiary ledgers are posted from the ledger copy of the invoice, while the register serves as a posting medium for the general ledger.

A monthly recapitulation of cash receipts serves as a posting medium for both the general ledger and subsidiary ledgers.

Closing Procedure

On or about the twentieth of each month a schedule of journal vouchers is prepared by each division, describing all journal vouchers which are to be prepared, and the dates on which they are to be completed. At a meeting of the chief

clerks of the various divisions the division schedules are discussed, if necessary revised and approved.

One of the main problems in expediting the closing of the records is the necessity of recording all charges for each month in that particular month. In the regular course of business, many of the labor and material tickets are not received in the various divisions of the Accounting Department until the second or third day after their dates of origin. Street tickets are prepared at night and turned in at the District Offices the same night or the following morning, where the clerks perform certain operations before the tickets are forwarded to the Distribution Department office. On the second day the clerks in the Distribution Office review the tickets before forwarding them to the Accounting Department, where they arrive in the afternoon of the second day or early on the third day.

The process of speeding up such tickets is started at the District Offices several days before the end of the month. A schedule is prepared by the Distribution Department covering the last few days of the month, showing the date and time when the various tickets must be delivered for the next operation. This schedule becomes effective on or about the twenty-seventh day of the month and the work of the last day of the month is delivered in the Accounting Department at noon on the following day. This result can only be obtained with the complete cooperation of the Distribution Department.

Similar coordination is required from other departments as a means of expediting the forwarding of reports, statements and other information to the Accounting Department at the end of each month. Vendors cooperate by sending their invoices promptly on or before the first day of the month.

In the preparation of certain labor and material journal vouchers which have practically the same series of accounts each month and similar arrangement, a decided saving of time is effected by eliminating the preparation of the longhand copies of such vouchers. The summaries of the labor and material charges are made so complete that typists are able to type the journal vouchers directly from the summaries, without any sacrifice of accuracy or control.

Closing is standardized to such an extent that the following schedule, making allowance for Sundays and holidays, will work out satisfactorily:

FIRST WORKING DAY. Most of the journal vouchers covering amortization of debt discount and expense, prepayments, deferred charges, accruals and reserves have been completed and are ready for posting. The various divisions receive the labor and material tickets from other departments for the last day of the preceding month and the routine of summarizing and voucherizing is begun.

Estimates of charges to the various operating accounts are submitted to the General Accounts Division by the other divisions. These estimates are the basis for an estimate of income and expense which is prepared during the afternoon and evening of the first day.

SECOND WORKING DAY. By the morning of the second day all of the daily time tickets and material tickets have been received and the process of summarizing is progressing towards completion. By noon of this day some of the journal vouchers are completed in the Payroll and Stores Divisions, the volume becoming quite heavy towards the close of the day.

The General Accounts Division submits to the officer in charge a complete estimate of income and expense for the preceding month's operations.

THIRD WORKING DAY. On the morning of the third day the summarizing of charges, in the Payroll and Stores Divisions, has been completed, and by the end of the day all of the journal vouchers have been prepared by the Stores, Payroll, and Invoice Divisions. The process of posting the subsidiary ledgers, which had gained momentum on the afternoon

of the second day, is going along at full speed on the third day.

FOURTH WORKING DAY. On the morning of the fourth day all the journal vouchers have been received in the General Accounts Division from the other divisions. It is important to make sure that all general charge (overhead) items are posted to the subsidiary ledgers promptly in order to expedite the proration of general charges later in the day. Experience teaches the accounting clerks and bookkeeping typists which journal vouchers are to be rushed and those which may be delayed for a while.

During the fourth day the journal vouchers for gas sales, etc., are completed in the General Accounts Division and posted. The accounts payable and accounts receivable registers are completed and posted to the general ledger.

The preparation of the work sheets for the distribution of general charges is commenced by a group of clerks who record thereon the total labor charges in the various fixed capital, operating expense and other accounts which are to receive a proportion of the general charges. The total amount of each overhead account is recorded for the purpose of proration. The actual proration is made by the Calculating Division on the following day.

FIFTH WORKING DAY. On the morning of the fifth day the work of prorating these general charges and accumulating the distribution thereon is commenced by the Calculating Division. This work will be completed before noon when the work sheets are returned to the General Accounts Division where the journal vouchers will be prepared. The journal vouchers will

be completed and posted to the general ledger by the middle of the afternoon.

In the meantime the purchased gas journal voucher is prepared together with all other clearing and miscellaneous vouchers, in order that, by the time the general charge journal vouchers have been posted to the general ledger, all vouchers affecting the month's business will have been posted, after which the trial balance can be prepared. The process of footing the general ledger and preparing the trial balance will be completed before the end of the fifth day. While the trial balance is in the process of preparation several of the accounting clerks will run off adding machine tapes on the subsidiary ledger sheets for the operating accounts to insure that the subsidiary ledgers are in balance with the general ledger. This serves as a check on the accuracy of the postings to the general ledger and the subsidiary ledgers.

Immediately after the completion of the trial balance, the balance sheet and income account are prepared. This may be done late on the fifth or early on the sixth day. These two statements are completed and sent to the Calculating Division where the footings are checked and the operating ratios and percentages are computed.

Conclusions

From the foregoing it is apparent that the secret of completing the month's business at the earliest possible moment is dependent upon definite schedules prepared in advance and strictly followed.

The company which operates under this plan has been able to produce its finished financial statements (Balance Sheet and Income Account) on the eighth day of each month where previous to the adoption of plan twelve to fifteen days were required.

Building Good-Will

By H. T. East

Sponsored by Customers' Relations Committee

service, eliminate red tape and make customer-company transactions convenient and satisfactory appear from time to time in the A.G.A. MONTHLY and others are in course of preparation for early publication. The work of this committee goes for naught unless the plans and ideas it makes available to the industry are studied and put to use by member companies.

It is acknowledged that many of the good-will producing activities formerly employed by gas companies have been dropped because of the necessity of effecting economies in operation. This makes it all the more necessary to adopt those ideas, plans and refinements of practice which entail little or no expense. The cumulative effect of many such betterments is sometimes greater than that of the costly major activities which were abandoned.

The Committee on Relations with Cus-

tomers is constantly engaged in making studies of plans developed by progressive companies throughout the country. Whenever it appears that something worth while has been devised the subject is written up and broadcast to the industry through the medium of THE MONTHLY. That these ideas and plans are practical is evidenced by the fact that they are actually in successful use today. Naturally an idea that will work for one type of company will not always be fitted for another, but, in general, ideas of demonstrated merit can be altered until they are capable of being advantageously applied by any company.

The objectives of the committee can only be attained through the cooperation of the companies which the committee was organized to aid. The best ideas are of no value unless used. To date, the committee's big problem has been to place the results of its efforts in the hands of those who can and will use them. If all officers and department heads were awake to the im-

(Continued on page 391)

THE gas industry, through no fault of its own, has lost some of the good-will built up by years of effort. The trend of legislation, rate agitations and customer complaints all offer unmistakable proof that the industry has lost some of its former standing. The change in public attitude is one of the products of the economic depression and as general conditions continue to improve it is probable that the animosities engendered by economic stress will gradually disappear. The need for immediate improvement in customer relations is so great, however, that the gas company which does not make a continuous effort to merit and gain the good-will of its patrons is derelict in its duty to the industry of which it is a part.

The American Gas Association through its Committee on Relations with Customers has been active in pointing out the need for improving customer relations and in citing specific steps which may be taken to gain the desired end. Articles which outline some workable plan to improve

HOME SERVICE COMMITTEE

RUTH KLEINMAIER, Chairman

JESSIE McQUEEN, Secretary

Gas Consumption Data in Cooking Tests

GREATER SERVICE NEWS, the bill enclosure used by the Consolidated Gas Company of New York, has included a brief story of the results of cooking tests recently made by the home service division to determine the approximate consumption and cost of gas used in cooking average meals. The test work was done under the supervision of Althea Lepper, head of the home service division and this material was made the basis of a series of newspaper advertisements used by the gas company showing the excellent cooperation that is possible between the home service and advertising departments.

The articles that appeared in GREATER SERVICE NEWS follow:

"Half a cent per person per meal is the average cost of gas for cooking breakfast, lunch and dinner for six people, on a modern gas range, according to thorough tests just completed by your Home Service Division.

"Last month an analysis of the cost of gas for cooking dinners alone was made and the cost of a dinner for six was found to be little more than one cent per person.

"With breakfast, and lunch added to the dinner the cost of gas for the entire day averaged only a half cent per person per meal because breakfast is usually a light meal. The toast on the breakfast menu was made in the oven of the gas range and coffee was made over the gas flame of a top burner.

"The day's three menus with the cost of food and amount and cost of gas consumed were as follows:

Breakfast
 Sliced Oranges, 18¢
 Scrambled Eggs, 23¢
 Canadian Bacon, 30¢
 Buttered Toast, 12¢
 Coffee, 16¢
 Total cost, \$.99
 Number cubic feet of gas consumed, 10
 Cost, \$.0115

Luncheon
 Red Salmon Pie, 61¢
 Baked Potatoes, 6¢
 Bran Muffins, Butter, 15¢
 Gingery Lemon Pudding, 16¢
 Total cost, \$.98
 Number cubic feet of gas consumed, 35
 Cost, \$.0402

Dinner *
 Baked Ham in Milk, 47¢
 Carrots, Peas, Celery in Casserole, 21¢
 Sweet Potatoes, Pineapple, 16¢
 Rye Bread, Butter 15¢
 Spicy Apple Crisp, 15¢
 Total cost, \$1.14
 Number cubic feet of gas consumed, 25
 Cost, \$.02875

"A test made recently by your Home Service Division showed that it takes

less than 6 cents' worth of gas to cook a roast beef dinner for six people.

"The oven was used for roasting the beef, and baking cake. The top burners were used for cooking asparagus, boiling new potatoes and boiling water for coffee.

"Six cents for the gas is less even than the cost of bread and butter, and add to that the butter used on vegetables, the cost of the gas is less than half the cost of bread and butter.

"The menu with the food cost was as follows:

Melon and raspberry cocktail.....	\$.37
Roast beef (3 1/4 lbs., boned and rolled)	1.31
Steamed asparagus.....	.29
Boiled new potatoes.....	.15
Whole wheat bread and butter.....	.08
Old fashioned strawberry shortcake52
Coffee10
Extra butter for vegetables.....	.05

Total food cost.....	\$2.87
5 1/2 cubic feet of gas.....	.0592

"Another meal was chosen that would make an abnormally heavy use of gas in cooking a dinner for six people. The broiler or oven was in constant use. The gas used cost only six and three-tenths cents. The menu with the cost of food was:

Cream of celery soup.....	\$.26
Broiled lamb chops and kidneys.....	.83
Broiled tomatoes.....	.21
Candied sweet potatoes.....	.25
Bran muffins and butter.....	.25
Apple pie and cheese.....	.38

\$2.18

"A broiled-steak dinner with French fried potatoes, new peas, and chocolate cornstarch pudding used only 4 cents' worth of gas. This was also a dinner for six, and the gas used cost only six-tenths of a cent per person.

"The gas range was started from cold for each test."

Gassettes

BRIDGE PARTIES, WORCESTER, MASS.—During this last year the home service department of the Worcester Gas Light Company offered a new project to the organized clubs of Worcester and Fram-



Reading the gas meter during the cooking tests made by Home Service Division to determine the exact amount of gas consumed in cooking a meal

ingham. The express purpose of this project was to bring representative groups to the gas company display floor so as to direct the attention of varied audiences to modern gas equipment. Letters were sent to club program chairmen and were followed by immediate response. The gas company entered in no way into the financial arrangements for these parties, letting each club sell its tables for what it wished, furnish its own prizes and collect its own money. The gas company offered the sales floor space and chairs, furnished refreshments and gave at each party a ten-minute talk on "New Gas Equipment." Following each talk either Mrs. Lyda Flanders, home service director, or one of her assistants visited each table, answering questions and explaining the merits of the equipment to persons interested.

The gas company feels that this was a successful project at this time. First, because modern gas equipment was brought directly to the public's notice and its many advantages explained to such a varied group; secondly, because of the appreciation of the clubs for the courtesy of the gas company and also as an aid to their own organizations. The company has felt that it has been the only project in which it has been possible to bring groups of men in touch with demonstrations of gas equipment. Of the 8,344 people in attendance at these parties, about 30 per cent were men, most of whom were interested in new equipment.

BROOKLYN HAS BUSY SEASON—Members of the Home Service Division of the Brooklyn Union Gas Company during the ten-month period from September, 1932, to June, 1933, held a total of 665 demonstrations and classes. As a result of these activities 32,277 persons were reached according to Miss Ruth Soule, director of the division.

Of the number of persons mentioned above, 26,449 were reached through classes and demonstrations, 5,282 through home calls. Of the total number of home calls, 4,972 were made regarding ranges and 1,736 about refrigerators.

NEW ENGLAND HOME SERVICE MEETING—At the June meeting of the New York-New England Regional Gas Sales Conference the Home Service group of New England held a luncheon meeting with Mrs. Leonora Pendegast presiding as chairman. H. R. Sterrett, president of the New England Gas Association, extended greetings and spoke briefly on recent trends in home service work. Miss Ruth Kleimmaier, chairman of the A. G. A. Home Service Committee, discussed home service work in general through the Association and then touched briefly on "What Home Service Can Do for Modernizing the Kitchen," which was the subject of her talk on the general sessions program of the sales conference. Mrs. Dorothy McGeehan, of the Inter-

AMERICAN GAS ASSOCIATION MONTHLY

Women's Magazines Stress Value of Gas as Fuel

WOMEN'S magazines recently have been carrying many articles of particular interest to the commercial group of the gas industry.

"Be a Better Buyer" is a series running in *Pictorial Review*. In many of these articles the services of the American Gas Association have been mentioned and Headquarters has received approximately 50 letters of inquiry from people who have read these articles asking for material mentioned. Particular reference has been made to the new developments in gas appliances and the work of the A.G.A. Testing Laboratory.

A series of laundry articles has been appearing in *McCall's* on test work that has been carried on by that magazine in cooperation with the University of Nebraska. This laboratory has as part of its equipment a gas water heater, a water softener, and a gas laundry stove.

House remodeling was discussed in a series of articles in *Better Homes and Gardens* and the kitchen was discussed as part of the series.

Delineator has been carrying a series of articles called "The Home Bulletin" or the "New in the News" and the September issue of this magazine gives an article on gas ranges, illustrated with a range of several years ago and a modern range to show the comparison between old and new equipment.

Air conditioning has been discussed in several magazines—*American Home, Forecast* and *Good Housekeeping*.

Budgets for time, money and food have been frequently mentioned, but the *Ladies' Home Journal* has particularly considered the subject.

national Nickel Company, also presented a paper on kitchen planning, showing in illustration an interesting sound film on "The Story of Monel Metal."

An interchange of ideas and experiences took place following the program with the two questions of most interest being oven canning and meat shrinkage.

GAS KITCHEN ON WHEELS—The Peoples Natural Gas Company which serves a territory in western Pennsylvania and Ohio has set up a travelling kitchen completely equipped with modern gas appliances. Miss Pearl Gray, home service director, travels with the kitchen and has found it received with great interest by groups of women in the towns visited.

HOME SERVICE STORY OVER THE RADIO—Mrs. Alyce Lytle, home service director of the Consolidated Gas Electric Light & Power Company of Baltimore, recently presented over the radio to her audience a full story of home service work done by the Baltimore company.

Kitchen planning has been the keynote in all magazines for the last four or five months. The June issue of *House Beautiful* has a particularly good article.

The Western magazine, *Sunset*, in its June issue carried an article on oven canning. This was reproduced later in the bill enclosures of the Portland Gas & Coke Company.

The April issue of *Woman's Home Companion* has an article "Turn on the Hot Water." We know of at least one company that has had reprints of this to use in distribution to their company mailing list. A monthly feature of this magazine is a page called "Keeping Posted" listing the many new ideas in kitchen equipment of the gadget type.

Model houses that have been featured so much in World's Fair advertising are covered frequently in the women's magazines. The September issue of the *Ladies' Home Journal* illustrates an article on "The Tired Housewife" with pictures showing the trend in kitchens which constitutes a part of the exhibit of the American Stove Company in Home Planning Hall in the Century of Progress. *Good Housekeeping*, in its August issue, describes the Stran-Steel which has been furnished by *Good Housekeeping* and which contains a gas stove in the kitchen.

Welfare food lists are of help as every home service department is called on at some time to assist in the work of the local welfare organizations. The June issue of *Practical Home Economics* has an article on "Meal Planning from Welfare Food Lists" which gives an excellent bibliography for such a problem.

Mrs. Lytle frankly discussed with the women the entire scope of activities, bringing out the reasons why certain projects were carried on and the general acceptance that had been given to home service by its women customers. Many women who are in contact with the gas company home service department are not fully aware as to the complete program that is carried on and a story of this sort presented as it was by Mrs. Lytle has been well received.

CLASSES FOR COMPANY EMPLOYEES—The Home Service Department of the Allentown-Bethlehem Gas Company under the direction of Mrs. Dorothy Sapoch has been assisting in setting up a foundation for future sales. Questions about baking problems coming into the company brought out the plan to give employees who have contacts with the public, a course in cookery. The object of the course was to give these employees the housewife's point of view concerning the appliances which she uses.

NATURAL GAS DEPARTMENT

GEORGE W. RATCLIFFE, Chairman

A. E. HIGGINS, Secretary

FRANK L. CHASE, Vice-Chairman

Safety Precautions in Drilling Wells
for Gas and Oil

By C. F. Huff

Superintendent, Columbia Oil & Gasoline Corp.

THE consumers of natural gas or the purchasers of gasoline or other oil products have little conception of the equipment necessary, or the unusual type of labor employed in the drilling of wells for gas and oil or of the many hazards which have to be met at each stage of the work.

Unlike the carefully planned manufacturing plant, built upon a selected site, with transportation, fuel and water available, the locations selected for wells are made from study of underground formations and with almost utter disregard for surface conditions.

The location may be on a mountain side, and far removed from improved roads. To move in rig material, machinery and equipment is in itself a difficult operation. The erection of the drilling rig, and the "rigging up" of machinery and drilling equipment under such surroundings requires the greatest care.

In the oil and gas fields of the eastern section of the United States, cable tools are most generally used in drilling and the hazards which must be met are many and unusual.

It should be remembered that the entire outfit is designed for temporary use; in most cases the time required for the completion of wells being from 30 to 90 days, yet the equipment must do the work efficiently, safely and at minimum cost.

In the earlier days of the industry most wells were drilled by contract at a rate per foot drilled. Contractors employed men who were capable of "making hole" and drillers and tool-dressers as a class, were care-free and willing to take a chance, which added to the natural hazards of the business. The old school of drillers and tool-dressers is rapidly fading out with the passing of contract work, as large companies find it more practical, less expensive and more satisfactory to have their wells drilled with their own tools and equipment and with labor for most part continuously employed.

Independent operators, when not equipped to do their own drilling, still contract the major part of their work and the men now employed by these contractors, are alive to the new order of things and they too are now safety-conscious. The contractors themselves, most of whom are practical drillers, know the hazards to be met and are alive to the fact that money and time may be saved in recognizing the fact that these hazards do exist and are looking for methods to meet them.

This change has resulted in the employ-

ment of more efficient men who have pride in years of service, and who have come under the direct influence of efficient management and safety teaching.

Notwithstanding all this, hazards remain and it is only by the developing of safety consciousness in the men that accidents are prevented in this work.

It may be interesting to recall a few accidents within our experience, resulting largely from carelessness or thoughtlessness of the men involved.

A few years ago, while running tools in the hole, the driller was looking up in the derrick to locate the string on the cable that marked the measurement of the depth. He thoughtlessly reached out his hand and took hold of the cable near the shaft and his glove caught on a wicker on the line and he was taken around the bull wheels a number of times before the engine could be stopped—a case of thoughtlessness.

On another occasion casing was being pulled out on account of a leak, the stem was standing in the derrick and the tool-dresser climbed the derrick to the top of the stem to put on the rope socket; he used both hands on the wrench which slipped, striking him in the face, causing him to fall from the derrick. This could have been avoided, either by taking the stem down and working on the ground, or if the tool-dresser had made use of a safety belt.

Another accident: When pulling a bailed the telegraph cord became fouled on a bracket in belt house, causing the engine to run away; the driller went to engine house to shut down engine and threw the cord off the throttle. At that instant the fly wheel blew up and a piece of the wheel cut the driller's arm off at the shoulder.

Such accidents give an illustration of what may happen.

Some of the principal operations to be especially watched are as follows:

Rigging Up

Handling and lifting heavy tools in place to start drilling.

Climbing the derrick to install necessary equipment, which starts at the derrick floor and ends at top of derrick.

Spudding In

Jerk line breaking.

Jerk line whipping sideways, if not bridled down.

Drive clamp breaking when driving pipe.

Handling and lifting heavy tools.

Handling bull ropes in pulling tools.

Drilling on Beam

Running bull wheels too fast in letting in tools.

Temper screw breaking in switching tools loose.

Worn box or screw on temper screw, allowing screw to run away.

Climbing around derrick, handling equipment.

Drilling into a pocket of gas or oil unexpectedly and igniting from the forge or open stove.

Putting in or pulling casing without due regard as to what the derrick will stand.

Starting gas engine by tramping fly wheel.

The following suggestions will show some things being done to prevent accidents, save money and to expedite the work:

Classifying accidents, two of the headings always in prominence are, first, that of "Handling Material," the other "Use of Hand Tools." These operations are always confronting the driller and tool-dresser. These men are favorable to reminders of safety practices.

In the succeeding paragraphs, the references are in connection with the working conditions under which wells are drilled as deep as from 2,000 to 7,000 feet with Standard Drilling Cable tools in the eastern part of the United States. The equipment is very heavy and moving it to the location offers a hazardous undertaking. Trucks used for this work should be equipped with winches, and carefully selected skids and equipment must be used. Rigs should be erected on solid foundations. The foundations should provide a solid base for the derrick so that its corners will not settle unevenly when put to

This is one of a series of articles prepared under the auspices of the Accident Prevention Committee of the American Gas Association in a cooperative effort with the National Safety Council to develop greater publicity on the safety practices in the natural gas industry.

hard use such as running and pulling long and heavy strings of casing. When foundation piers settle unevenly, the stability of the derrick is endangered. Uneven settling of the foundation throws the crown of the derrick out of line with the hole that is being drilled. This throws a twist or strain on every girt, brace and leg of the derrick. Such a derrick will not stand the same pull as one that is plumb.

Derricks should be substantially constructed to provide against any unforeseen stresses such as those caused by the driller endeavoring to free or pull a string of "frozen" casing. The combined mechanical efficiency of the ordinary band wheel, bull wheel and casing block is many times the lifting force of the engine. This enormous force with the engine is usually enough to pull the casing or wire line in two or to collapse the derrick. When pulling on casing, workmen should leave the derrick to avoid danger. Drillers, realizing the danger in connection with pulling in a derrick, sometimes operate the engine from the engine house.

In building wood rigs, only material that is structurally sound, free from serious defects and proportioned to the load requirements should be used.

In so far as safety is concerned, steel derricks, now mostly used, are considered superior to those made of wood; however, a steel derrick should be inspected frequently for loose nuts. Inspection of steel derrick followed by the tightening of loose nuts, is especially important and necessary during the first few days the derrick is in use and before running or pulling long and heavy strings of pipe.

Railed platforms completely surrounding the crown of the derrick give workmen the protection needed at this elevation.

Proper lighting is very important. Good light is required by every member of the crew no matter where he is working or what his duties are. Electric lighting plants are almost wholly used and considered safest. Improper or defective wiring in and around drilling derricks is a hazard that is especially dangerous when gas may be present. Wires should be inspected periodically, all switches being within gas-tight enclosures, and consideration given to the use of heavy glass outer globes or guards.

Stay in the clear of the bull ropes; it is bad practice to go through bull ropes when they are moving. There should be an attachment installed to lift the bull rope clear of the tug wheel while the band wheel is in motion and the bull wheel not in use, as the rope conforms readily to the iron tug and becomes a danger.

It is essential that a check be made of the bull wheel brake and lever in order to be assured that it will take a safe grip on the bull wheel. Make sure the floor fastenings are secure. If the brake band fails to hold, the bull wheel may gain tremendous momentum and blow up, possibly injuring workers and dropping the tools, tubing or casing into the hole.

All control levers and connections,

throttle cord and attachments should be inspected at regular intervals.

Although briefly stated, much of value is gained by removing unnecessary material from walk-ways and derrick floors. Tripping and stumbling is a controllable hazard. Cleanliness and neatness about the derrick tends to make the men more careful. A place for the tool and the tool in its place is a workable slogan.

See that tools are in serviceable condition, giving particular attention to tools that may slip and become broken under strain, causing men to fall or be struck by broken parts. Hatchets, hammers and sledges should have good handles and be tight. Chisels and cutters should not have burred heads. Flying fragments are a result of not dressing the tool heads.

The man at the power control must use extreme caution when a man is on the beam or in the derrick to avoid throwing him off.

Stand back from the well when going in with the bailer. Slack thrown in the line when the bailer hits the fluid or an obstruction has coiled around workmen standing close to the hole and has caused injury when the sand line again jerks taut.

A point worthy of use is flooring made of planks that have not been planed. The rough surface gives much more substantial footing when wet or if muddy, which it is difficult to avoid when spudding in.

The use of goggles has an important place in well drilling. Certain of the operators will find the goggles creating possibly a greater hazard than the apparent good to be obtained in their use. Consequently much consideration must be given this feature.

A device for reducing the hazard of running a measuring line has been developed, consisting of a steel line on a reel mounted on the rear of a small automobile truck and deriving its power through the medium of a chain and sprocket wheel connected with the rear wheel of the truck, which is jacked up from the ground when in operation.

When melting babbitt out of a rope socket, place the socket so as to heat it at the end, as the heating in the center may cause expansion at that point with a resultant explosion. Before babbitting a wire line into the rope socket, the socket should be warmed to a temperature that will expel all moisture in the socket; then apply a small quantity of oil or tallow into the socket before pouring the babbitt.

In placing the wire line on the bull wheel shaft, jacks or horses should be placed under the spool, making it easy to revolve the spool from which the line is unwound.

In tramping gas engines, avoid getting the feet too far over the spokes of the fly wheel, thus avoiding the possibility of getting caught when the engine takes off. Get help to start the engine when it is too heavy for one to start alone. Disconnect wire from spark plugs when repairing a gas engine. An accident might easily occur when a slight movement of the fly

wheel may trip the ignition and cause the engine to turn over.

In the use of gas engines on drilling wells, a water connection should be installed from the water circulating or cooling system to the exhaust pipe. This water creates a steam which will extinguish any flames that might exist in the exhaust, thus obviating any possible fire or explosion.

The drilling of wells is perhaps the most hazardous part of the oil and gas industry, and so long as wells are drilled, that hazard, to a more or less degree, will remain. Safety devices may be designed, and even set up as regular equipment; rules and regulations may be posted, but in the last analysis, the real results will come from the right sort of men, properly instructed and who are happy in their work and proud of their connection with their employers.

Carbonization Study Forms Tenth Report

THE tenth report on the cooperative carbonization studies of the United States Bureau of Mines and the American Gas Association has been recently issued by the bureau.

This report is Technical Paper 548, entitled "Carbonizing Properties and Constitution of No. 2 Gas Bed Coal from Point Lick No. 4 Mines, Kanawha County, W. Va.," by A. C. Fieldner, J. D. Davis, R. Thiessen, E. B. Kester, W. A. Selvig, D. A. Reynolds, F. W. Jung, and G. C. Sprunk. It gives the results of tests of the famous No. 2 Gas Bed Coal from Kanawha County, West Virginia.

The results show that this coal ranks among the best as regards yield and quality of gas and by-products. The microscopic examination shows that the No. 2 Gas Bed is composed of 50 per cent of bright coal, 45 per cent of semi-splint and 5 per cent of splint. This high percentage of semi-splint material contributes materially to the high gas, char, and light oil yields that characterize this coal.

Due to the high volatile matter content, the coke is friable and highly fractured. The cell structure is relatively coarse. The coal requires blending with some 20 to 30 per cent of low volatile coal, in order to produce strong metallurgical coke. However, the coke obtained on carbonizing unblended No. 2 Gas coal is excellent for domestic heating.

The following yields were obtained in a test conducted in an 18-inch diameter retort and at a carbonizing temperature of 1,000° C.: dry coke, 66.0 per cent; gas stripped of light oil saturated at 60° F. and 30 inches of mercury, 12,500 cu.ft.; dry tar, 13.5 gallons; light oil, 3.1 gallons.

The Gas Industry invites you to visit Gas Industry Hall.

TESTING LABORATORY

R. M. CONNER, Director

Managing Committee: J. S. DeHART, Jr., Chairman

N. T. SELLMAN, Secretary

Standards for Gas Appliances and Accessories and Their Relation to Industrial Progress

ORGANIZATIONS and industries, like individuals, never reach a state of equilibrium, they are either going forward or backward. There is no middle ground that can be reached where it is possible to maintain a prosperous business and yet ignore competition, neglect potential markets and overlook opportunities for improvement and expansion. This axiom is just as true when considered from the standpoint of the public utility as it is when applied to other industries or businesses, notwithstanding the fact that public utilities are of a quasi-monopolistic nature, operating under an exclusive franchise. This advantage is offset by limitations in earnings imposed through close state and federal regulation, while at the same time they are subject to all the austerity of competition common to businesses of a private character.

Gas utility companies and, in turn, gas appliance and equipment manufacturers have been faced with the keenest competition during the past few years ever witnessed by the gas industry. When at the turn of the century gas lighting suffered a severe setback due to the inroads of the newly perfected electric lamp, the gas industry looked to other outlets for its products. Through keen economic vision, planned research and development work, coupled with alert management, the gas industry set up a record of progress during the next few years which stands as a monument to the economic development of our country. Under present circumstances, when competition from coal, oil, and electricity in the field of heating confronts the industry in a measure which cannot be ignored there is but one answer, as there has been in the past. That answer is research, development, and progress within our own ranks.

A major step in this direction was taken when, in 1925, the gas industry established a national testing and research laboratory in the City of Cleveland, Ohio. Further progress along this line was evidenced through the opening of a similar laboratory in Los Angeles, California, in 1931, to better serve the interests of the industry on the Pacific Coast. It is believed that no one familiar with the history of the gas industry during the past few years can fail to recognize the value of these undertakings, (1) to the gas companies, through safer, more efficient and more satisfactory gas-burning equipment; better public relations; less service troubles, coupled with improvement in their competitive positions, (2) to the appliance manufacturer through

By F. R. Wright

Publications Editor, American Gas Association Testing Laboratory

standardizing appliance design and construction, thereby tending to reduce manufacturing costs and permitting the building of better appliances for the same money or the same general design of appliances for less, and (3) to the public by providing for the testing and certification of gas appliances in accordance with nationally recognized standards for construction and performance, and eliminating from the market, to a large extent, those appliances which do not meet the proper concepts of safety, substantiality, and durability.

The Laboratory's gas appliance testing and certification program has been made effective through the development of national construction and performance codes for gas-burning equipment. The work of preparing such codes has been carried on by committees representing not only the gas companies and appliance manufacturers throughout the United States and Canada, but also every interested scientific body, technical society, trade association, governmental bureau, general interest group, and consumer's organization in this country. Trained technicians, health authorities, Federal scientific experts, outstanding heating contractors, experts in home economics, insurance authorities, and many others, therefore, have had a part in drafting the testing codes for gas appliances which are national in scope and universally recognized as authoritative.

In 1931, the A.G.A. Approval Requirements Committee, which is the governing group responsible for the preparation and revision of requirements for gas-burning appliances, became a Sectional Committee of the American Standards Association. Since that time seven of the American Gas Association's codes have been approved as American Standards and one as American Recommended Practice by the American Standards Association. These include:

1. American Standard Requirements for the Installation of Conversion Burners in House and Water Heating Appliances.
2. American Standard Approval Requirements for Hotel and Restaurant Ranges.
3. American Standard Approval Requirements for Private Garage Heaters.
4. American Standard Approval Requirements for Clothes Dryers.
5. American Standard Approval Requirements for Incinerators.

6. American Standard Approval Requirements for Gas Heated Ironers.

7. American Standard Approval Requirements for Flexible Gas Tubing, and

8. American Recommended Practice Approval Requirements for Gas Ranges.

Revised approval requirements for water heaters, space heaters, gas ranges, and hot plates and laundry stoves, together with a new listing code for draft hoods are now pending before the American Standards Association for approval as American Standards. It may be of interest to note here that the revised standards for water heaters, space heaters, and for hot plates and laundry stoves have been expanded to include specifications for appliances designed to use propane gas and butane-air gas.

The Listing Requirements for Draft Hoods mentioned above mark the first of a series of codes now in the course of preparation for all types of gas appliance accessories. The development of these codes indicates another major step forward in the improvement of gas-burning appliances and control equipment which should not only prove of distinct value to manufacturers of such products but should also enable gas companies to render better service to their customers, resulting in greater satisfaction on the part of the public in the use of gas for domestic and commercial heating purposes. The following listing codes for accessories and controls were published by the American Gas Association Testing Laboratory and distributed for criticism in July of this year:

1. Tentative A.G.A. Listing Requirements for Gas Range Cocks, and

2. Tentative A.G.A. Listing Requirements for Gas Conversion Burners.

Several additional codes for the testing and listing of accessories were completed in July and are shortly to be released for criticism, including:

1. Tentative A.G.A. Listing Requirements for Pressure, Temperature, and Vacuum Relief and Automatic Gas Shut-Off Valves.

2. Tentative A.G.A. Listing Requirements for Water Heater, Gas Range, and Space Heater Thermostats.

3. Tentative A.G.A. Listing Requirements for Domestic Appliance Gas Pressure Regulators.

4. Tentative A.G.A. Listing Requirements for Electric Gas-Control Valves, and

5. Tentative A.G.A. Listing Requirements for Diaphragm Valves.

In line with the Association's established policy of extending its requirement activities to cover all common types of domestic and commercial gas appliances, as rapidly as conditions permit, subcommittees on A.G.A. Approval Requirements for Gas Refrigerators and Industrial Gas Boilers were organized in 1931, and undertook the preparation of codes for such equipment. In 1932, an additional subcommittee was appointed to take over the preparation of separate approval requirements for gas-fired unit heaters. Standards for these appliances were formerly included in the A.G.A. Approval Requirements for Central Heating Gas Appliances, but since such appliances are more in the nature of commercial units it was felt advisable to publish them separately from the standards for house heating equipment, and to place them under the jurisdiction of a committee more directly concerned with appliances of this type. In addition to these three codes, revisions to the A.G.A. Approval Requirements for Central Heating Gas Appliances were recently completed. In making these revisions the requirements affecting the construction of cast-iron and steel-plate boilers were taken up with the Boiler Code Committee of the American Society of Mechanical Engineers, and the codes of the two organizations correlated.

The following new and revised approval requirements were printed and distributed for criticism in July:

1. Tentative A.G.A. Approval Requirements for Gas Refrigerators.
2. Tentative A.G.A. Approval Requirements for Industrial Gas Boilers.
3. Tentative A.G.A. Approval Requirements for Unit Heaters, and
4. Recommended Revisions to A.G.A. Approval Requirements for Central Heating Gas Appliances.

Meetings of the interested subcommittees to consider criticisms received on the various standards will be held this month and the early part of October; consequently, any companies wishing to suggest changes in any of the codes published for criticism should forward such comments to the Chairman, A.S.A. Sectional Committee, Project Z-21, A.G.A. Approval Requirements Committee, American Gas Association, 420 Lexington Avenue, New York City, at once.

In view of the policy of the American Standards Association, which prevents the inclusion of references in American Standards to the seal or trade-mark of any particular organization, all references in the A.G.A. approval requirements to the Laboratory Seal of Approval are being deleted as each set of requirements is taken up for revision. As a result of this action it was considered advisable to publish a separate set of requirements relating to the Laboratory Seal of Approval, the Approval Seal for Flexible Gas Tubing, and the A.G.A. Listing Symbol. The A.G.A. Approval Requirements Committee, therefore, prepared a code of this nature which was recently published and distributed to member

companies of the Association. Additional copies of this code or of any of the others previously mentioned, may be secured upon

application to the American Gas Association Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio.

Allocation of Costs of Natural Gas Production and Pipe Line Companies

(Continued from page 371)

cost formula will be applicable. For instance, there may be a number of contracts to purchase certain minimum amounts of gas from other producers or pipe lines, obviously the purchased gas would not go below these minimums regardless of how low the load factor might go. Also, today, practically all maintenance work is performed during the summer months when the demands on the system are quite low and a certain amount of equipment is idle. If the load factor were raised above a certain point, it may become necessary to install stand-by or extra equipment in order that service may be maintained during the time maintenance work is in progress. It is well to investigate these and similar items when the costs over a wide range of load factors must be known.

It is very doubtful if the industry has a full appreciation of the value of data obtained from a cost allocation. Its value as a basis for rate-making has been mentioned briefly although a discussion of rates is beyond the scope of this paper. There are many other ways in which such information may be utilized to advantage and undoubtedly more efficient management would result from the knowledge of such costs.

Acknowledgment

The subject matter of this paper has been revived by several members of The Rate Structure Committee and others in the industry who have submitted many valuable suggestions which have materially aided the author in the preparation of this paper.

Special acknowledgment it due to R. G. Winans, consulting engineer, New York, N. Y., H. D. Hancock, Henry L. Doherty & Company, New York, N. Y., and P. McDonald Bidison, Consulting Engineer, Dallas, Texas.

Building Good Will

(Continued from page 385)

portance of taking decisive steps to improve customer relationship the ideas would be placed in effect and progress made.

International Gas Conference and Fifteenth Annual Convention of the American Gas Association

At the convention, in Chicago, the Committee on Relations with Customers will present two papers on customer contact problems. One of these "Improving Customer Relations through Bill Investigations" will contain many valuable ideas and new wrinkles which can be employed in handling those ever present high bill complaints. The other subject, "Information on Customers' Orders" proves that merely by paying more attention to the amount and quality of information obtained and entered on customer applications and orders the service to customers may be immeasurably improved. These papers not only contain workable ideas, but illustrate the fact that opportunities to improve service and make friends lie in many of our every day routine performances which are usually considered as having little or no effect on the public attitude toward the company.

All who are interested in customer relations are invited to attend the Accounting Section sessions at the Chicago convention and take part in the discussions of papers and problems concerning that all important matter, improvement of good-will. The gas business is on the spot and the time to analyze your situation and put plans for building good-will to work is now.

Louisville Merger

Stockholders of the Louisville Switch & Signal Company and the Peerless Manufacturing Company, being the same, have consolidated the two companies under the name Peerless Manufacturing Corporation. The general offices and factory are located at 1400 W. Ormsby Street, Louisville, Ky.

The Peerless Manufacturing Corporation will, with the same personnel and equipment, supplemented by additional technicians and equipment, continue to manufacture all products furnished by the Louisville Switch & Signal Company, as well as all products of the Peerless Manufacturing Company.

See the Gas Industry on display at the World's Fair in the Home and Industrial Arts Group.

Monthly Summary of Gas Company Statistics

FOR MONTH OF JUNE, 1933

Issued August, 1933, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

COMPARATIVE DATA ON THE MANUFACTURED AND NATURAL GAS INDUSTRY FOR THE MONTH OF JUNE, 1933

	Month of June			Six Months Ending June 30		
	1933	1932	Per cent Change	1933	1932	Per cent Change
Customers						
Domestic (Including House Heating).....	14,307,600	14,751,400	— 3.0			
Industrial and Commercial.....	931,400	960,900	— 3.1			
Total	15,239,000	15,712,300	— 3.0			
Revenue (Dollars)						
Domestic (Including House Heating).....	36,873,400	39,809,700	— 7.4	271,076,300	294,215,800	— 7.9
Industrial and Commercial.....	14,189,600	14,283,900	— 0.7	95,479,800	104,055,800	— 8.2
Total	51,063,000	54,093,600	— 5.6	366,556,100	398,271,600	— 8.0

COMPARATIVE DATA ON THE MANUFACTURED GAS INDUSTRY FOR THE MONTH OF JUNE, 1933

	Month of June			Six Months Ending June 30		
	1933	1932	Per cent Change	1933	1932	Per cent Change
Customers						
Domestic	9,312,500	9,669,300	— 3.7			
House Heating	50,500	51,100	— 1.2			
Industrial and Commercial	477,700	491,700	— 2.8			
Miscellaneous	7,500	7,500	—			
Total	9,848,200	10,219,600	— 3.6			
Gas Sales (MCF)						
Domestic	20,998,700	22,944,100	— 8.5	127,055,100	138,735,400	— 8.4
House Heating	472,900	510,700	— 7.4	14,533,000	14,949,000	— 2.8
Industrial and Commercial	6,886,000	6,558,600	+ 5.0	40,233,800	43,731,900	— 8.0
Miscellaneous	124,900	135,500	—	984,100	1,045,100	—
Total	28,482,500	30,148,900	— 5.5	182,806,000	198,461,400	— 7.9
Revenue (Dollars)						
Domestic	25,251,100	27,724,600	— 8.9	150,780,000	166,162,100	— 9.3
House Heating	369,700	408,700	— 9.5	9,917,500	11,094,200	— 10.6
Industrial and Commercial	5,530,800	5,852,300	— 5.5	34,148,800	38,846,400	— 12.1
Miscellaneous	94,000	107,300	—	708,500	725,000	—
Total	31,245,600	34,092,900	— 8.4	195,554,800	216,827,700	— 9.8

COMPARATIVE DATA ON THE NATURAL GAS INDUSTRY FOR THE MONTH OF JUNE, 1933

	Month of June			Six Months Ending June 30		
	1933	1932	Per cent Change	1933	1932	Per cent Change
Customers						
Domestic (Including House Heating).....	4,944,600	5,031,000	— 1.7			
Commercial	425,700	440,200	— 3.3			
Industrial	14,500	14,700	— 1.4			
Main Line Industrial	4,000	4,700	—14.9			
Miscellaneous	2,000	2,100	—			
Total	5,390,800	5,492,700	— 1.9			
Gas Sales (MCF)						
Domestic (Including House Heating).....	13,347,800	13,901,300	— 4.0	170,844,100	179,837,700	— 5.0
Commercial	4,229,700	4,254,700	— 0.6	50,850,900	51,404,400	— 1.1
Industrial	27,763,900	26,816,000	+ 3.5	159,989,700	167,073,500	— 4.2
Main Line Industrial	10,485,100	9,436,400	+11.1	62,175,200	55,119,900	+12.8
Miscellaneous	512,300	447,700	—	4,359,700	4,832,500	—
Total	56,338,800	54,856,100	+ 2.7	448,219,600	458,268,000	— 2.2
Revenue (Dollars)						
Domestic (Including House Heating).....	11,252,600	11,676,400	— 3.6	110,378,800	116,959,500	— 5.6
Commercial	2,191,700	2,264,900	— 3.2	22,841,100	23,819,600	— 4.1
Industrial	5,234,900	5,029,000	+ 4.1	30,392,100	33,457,300	— 9.2
Main Line Industrial	1,055,400	966,800	+ 9.2	6,655,300	6,434,700	+ 3.4
Miscellaneous	82,800	63,600	—	734,000	772,800	—
Total	19,817,400	20,000,700	— 0.9	171,001,300	181,443,900	— 5.8

Natural Gas Sales Gain

NATURAL gas sales for the month of June amounted to 56,338,800,000 cu.ft., an increase of nearly 3 per cent over the corresponding month a year ago. Both the manufactured and natural gas groups reported a distinct upturn in gas sales for industrial purposes. Sales of manufactured gas for industrial-commercial uses showed a gain of 5 per cent for the month. Natural gas sales to ordinary industrial customers gained 3.5 per cent, while sales to large scale industrial users increased more than 11 per cent. Total sales of manufactured gas reported for June equalled 28,482,500,000 cu.ft., a decline of 5.5 per cent.

Revenues of the manufactured and natural gas industry aggregated \$51,063,000 for June 1933, as compared with \$54,093,600 for June 1932, a decline of 5.6 per cent.

The manufactured gas industry reported revenues of \$31,245,600 for the month, a drop of 8.4 per cent from a year ago, while revenues of the natural gas industry totalled \$19,817,400, about equal to the figure reported for June 1932.

For the six month period ending with June, revenues of manufactured and natural gas companies aggregated \$366,556,100, a decline of 8 per cent from the first half of 1932.

The manufactured gas companies reported revenues of \$195,554,800 for the first six months of 1933, or 9.8 per cent less than for the corresponding period of the preceding year, while revenues of the natural gas utilities amounted to \$171,001,300 for the same period, a decline of 5.8 per cent.

Guests from Abroad Will Visit American Cities

(Continued from page 361)

Frank West, M. Inst. Gas E., Chairman and Managing Director, Derbyshire Silica Firebrick Company, Ltd. Hartington.

Chas. F. Williams, J.P., Director, The Newport (Mon.) Gas Company.

* This delegation is scheduled to arrive in Quebec, Canada, September 15, will spend the following day in Montreal and on September 17 will go to Ottawa to attend the twenty-sixth annual convention of the Canadian Gas Association. They will depart from Ottawa on September 19, en route to Chicago, and will make stops at Toronto, Hamilton, Niagara Falls and Detroit, arriving in Chicago September 24. After leaving Chicago they will visit the following cities:

Cleveland, where they will inspect the American Gas Association Testing Laboratory; Pittsburgh, Pa., Washington, D. C., Baltimore, Md., Philadel-

phia, Pa., New York, Boston, Mass., from which point they plan to sail for Europe on October 8.

Now It Can Be Told

(Continued from page 366)

were had with advisers of the Administration and certain modifications in the code were suggested. Messrs. Russell, Beckjord and Rudd returned to Washington at great inconvenience and discomfort to themselves and participated in the negotiations.

In the meantime, the Natural Gas Department Committee was equally busy and absorbed in Washington and the two codes were worked out in the same headquarters in the Mayflower. As a matter of fact, Mr. Gallagher put in more hours of labor than anyone. During all these vexatious days, Mr. Sperry, President of the Washington Gas Light Company, extended the A.G.A. codifiers every possible courtesy and assistance, including the use of his car, typing at his office, and contacts in Washington. Valuable as these services were, however, they were incidental to the competent advice and counsel constantly volunteered at all times by Mr. Sperry, who practically devoted all his time to the immediately urgent needs of the industry.

Finally, there being an end to everything, even to "coditis," General Johnson and the other officials of the N.R.A. late at night, Friday, August 11, accepted the substituted paragraphs in the two codes. So far as wages and working hours are concerned the provisions relative to manufactured gas and to natural gas are identical, the only difference being in the nomenclature of employees particularly applicable to the industries.

Immediately upon acceptance of the code by the N.R.A. word was flashed to Association Headquarters

in New York, where the office staff was held night after night waiting for the signal. The manufactured-mixed gas code was three pages long and there was a letter of transmittal to accompany it. That made a four-page job for the stencil cutters, and the usual proof-reading. The mailing list was 526, calling for a total of 2,104 pages to be run off on the mimeograph machines, and later to be assembled, clipped, folded, inserted in addressed envelopes, stamps affixed, and delivered to Uncle Sam. Working at top speed, the Headquarters personnel got the whole job in the mails within two hours.

It was the same thing the next day, Saturday, August 12, only this time the natural gas code got its play. At 5 o'clock that afternoon everything had been cleaned up, including an additional two-page mailing to manufactured gas companies, which ran up the total for the day to 3,140 sheets of paper and 1,023 envelopes.

But it wasn't so bad, after all. Didn't Headquarters get the first blue eagle issued to the gas industry!

HOME SERVICE IN WELFARE WORK—

For the past several months the Fall River Gas Works Co., Fall River, Mass., has been cooperating with the city welfare department in teaching methods of food preparation to needy families who receive food from the city. It was found that many people did not know how to use the foods which were being distributed to them and so the home service department of the gas company, under the direction of Mrs. Sadie Minikin, planned a schedule of twenty-one menus using simple staple foods and enclosed them in each basket of food distributed. Invitations to attend the cooking demonstrations using these menus were also enclosed and demonstrations were held two afternoons each week over a period of eight weeks with good attendance.

PLAYLET—"MRS. RIP VAN WINKLE SLEEPS"—"Utility Hall," headquarters of the home service department of the Equitable Gas Company, Pittsburgh, Pa., has been used by many local club women for their group meetings. Recently a two-act playlet, "Mrs. Rip Van Winkle Sleeps," was given by a women's club, the subject of the play bringing out the contrast between the kitchen one hundred years ago and today. The modern appliances sold by this company were presented by the players.





Here's The Book You've Asked For!

"One of the best books on the subject I have ever seen,"
William G. Christy, Smoke Abatement Engineer, Hudson County, N. J.

"A shocker all the way through," Milwaukee Sentinel.

"This very informative and stimulating book ought to make a vital factor in the attack," New York Times.

"An all inclusive and authentic reference work," Floyd W. Parsons.

"The imperative title weighs more and more heavily as one progresses through the serried ranks of statements," Herald Tribune, New York.

"It should do a lot of good in helping to eradicate the smoke nuisance," American Gas Journal.

"There is enthusiasm and inspiration here for all gas men," Gas Age-Record.

THE title is "Stop That Smoke!" The author is Henry Obermeyer. Now, for the first time, you get all the facts about the smoke nuisance within the covers of a single book.

This book is capable of doing a tremendous amount of good for the gas business if distributed in the proper quarters—libraries, civic planning bodies, health departments, medical associations and other anti-smoke crusading groups.

The executive head of every gas company should have a copy, and sales managers, advertising men and home service directors should not be overlooked.

Imagine a company library not having this book on hand for reference purposes!

By special arrangement with the publishers, the following substantial discounts over the list price of \$2.50 a copy are offered to A.G.A. members: Single copies, \$2.25 each. Five copies, \$2.00 each. Ten copies or more, \$1.75 each.

Place your orders promptly with Association Headquarters.

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420 Lexington Avenue
New York, N. Y.

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Chairman, Gas Section—A. M. Beebe, Rochester Gas & Electric Corp., Rochester, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

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International Gas Conference
AND
Fifteenth Annual Convention
of the American Gas Association

Chicago, Ill.

Sept. 25-26-27-28-29, 1933

Personnel Service

SERVICES OFFERED

Gas and fuel engineer with additional training in metallurgy and ceramics. Experienced in research and varied industrial fields involving application of heat. Employed last four and one-half years as research fellow in ceramics department of well known university. Will go anywhere in U. S. Married (28). 744.

Engineer; M. S. in M. E., major in Gas Engineering. Four years' operating and all-round experience including utilization engineering with large natural gas utility; married; (29); willing to go anywhere. 745.

Sales executive-engineer; university graduate. Seven years' blast furnace and coke plant operating experience followed by seven years' sales experience industrial gas combustion equipment, industrial furnaces, and heavy plant equipment—wishes position in equipment sales or industrial department of strong company. Married (36). 746.

Manufacturing engineering executive: technical education, desires connection with reliable gas range or appliance manufacturer. Formerly chief engineer of two well known gas range companies. Capable complete charge of development, experimental, laboratory, research departments. Understand vitreous enamel application from start to finish. 747.

Gas engineer with twenty years' operating and managerial record. Experienced heavy oil operation, reforming natural gas and mixing of manufactured and natural gases. Qualified in sales promotional work and industrial application of gas. Formerly research assistant, public utility management at well known graduate school. Open for permanent or temporary connection. 748.

Sales engineer—eighteen years' experience covers industrial steam boiler application, large volume water heating and management of house heating department in all its branches of service. Broad general and technical knowledge of all heat using industries; experience includes surveys, sales work, installation supervision and operating "follow up." Married. 749.

Appliance salesman capable of selling and handling any territory. Have ability to supervise salesmen, manage a stove department, create new business and equipped with knowledge of the stove business in general. Location secondary consideration. 750.

Development and Sales Engineer (M. E.) having eighteen years' gas and electric company, as well as large oil burner company sales experience. Established enviable record in electric and gas industrial sales and pioneered development and did much original work in central gas heating and air conditioning equipment. 751.

Sales Engineers with technical experience and with thorough knowledge of all branches of the gas business offers his services to company seeking representative for sales development work among gas and oil companies. Can produce results. This is a real opportunity to secure services of a high class man. 752.

House heating engineer (25) graduate of a gas engineering school, B. S. and M. S. with advanced work in heating and ventilating. Have two years' experience in house heating. Desire employment in either house heating or industrial sales work. 753.

Man well qualified by education and experience to head the **Industrial Department** of a large utility. Resourceful, creative, aggressive authority on industrial gas usage and technology. Useful in consulting capacity, reports clearly, in non-technical language. Responsible position sought. 754.

Manufacturers' Representative. Now engaged as salesman and engineer by natural gas utility in all phases of company's business. Previous to gas experience was for six years sales engineer and district salesman for large national manufacturer of fuel burning equipment. Engineering college graduate. Married (38). First preference southeast. 755.

SERVICES OFFERED

Industrial fuel sales engineer. Experience gained with Eastern utility. College graduate, member A. S. M. E. Qualified make surveys, design burners, piping and auxiliaries. Familiar with all principal metallurgical operations, ceramics, baking, etc. Understands space heating and air conditioning. Experience and outstanding sales ability sufficient take charge territory or department. 757.

Young engineering graduate (28) with six and one-half years' experience in managing the operating detail of small gas companies, would like to take complete charge of and be responsible for a small company and devote his training and experience to the improvement of its service and earnings. 758.

Manager, natural gas, manufactured gas and electricity. Excellent record in developing rundown properties and obtaining new business. Can reduce expenses and make money. 759.

Position wanted with appliance manufacturer. Experience includes executive training, and covers over fourteen years in the sale of tin gas meters. Offers character, integrity and ability with service. Thoroughly conversant with management problems. Would prefer position in the East. 761.

As **sales manager** or manufacturer's representative by engineering graduate with more than eighteen years' experience in sales and merchandising with natural gas, manufactured gas and electric utilities and in various operating and executive activities. Last few years work include unusually broad worthwhile national contacts with gas companies in many states. 762.

Gas analyst. Thoroughly experienced in all phases of analyses of natural gas, producer gas, tar and gas mixtures. Also coal, coke, tar analyses. Well trained for gas producer laboratory. 763.

All around gas man (31) married, graduate **chemical engineer**. Experienced in design, construction and operation of water gas plants and high and low pressure distribution systems. Good business experience and judgment. Interested in engineering, operation, construction, sales or management. Location not important. Available immediately. 764.

Trained young experienced aggressive leader desires position in domestic **gas sales**. Has been very successful as complete dealer appliance Sales Manager and later led the New York City market for some years in sales for a well-known range organization. Can handle industrial work. 765.

NRA will boost your operating costs. I can boost gas-using appliance sales by enlisting interest and cooperation of plumbers and dealers. I know how, because of 6½ years of well-attested success in working with these men along closely similar lines. Salary ideas not cheap, but attuned to 1933. 766.

Industrial gas sales-engineer, six years' experience large Eastern combination company. Broad experience in sales, installation and service of varied industrial applications as: bake ovens, boilers, furnaces, etc. Familiar with all competitive fuels, preparation of estimates and cost surveys, and economical rate determinations. University graduate, 34, married. 767.

Sales executive available. Thirteen years' experience as commercial and sales manager. Gas and electric operations in small towns and large cities. Natural gas conversion experience. Organized and trained sales personnel in domestic, commercial, house heating and industrial fields. 768.

Reliable and ambitious young man desires a position in the **air-conditioning** field. Has received theoretical and practical knowledge and experience from technical school. Willing to travel and to work hard for advancement. 769.

SERVICES OFFERED

Gas Engineer. Technical training chemical engineering and gas and fuel engineering. Experience covers gasoline plant construction, natural gas plant construction and operation, preparation of cost accounting, depreciation studies, original cost valuation studies and Public Service Commission relations. Now available, will connect anywhere to prove ability and secure permanent position. Married. 770.

Sales manager—engineer. University graduate. Good general business background. Thirteen years' experience heating, ventilating, air conditioning. Industrial and residential work. Capable making own drawings, layouts, estimates, assume complete responsibility installations, credits, collections. Acquainted, architects, engineers, contractors, builders, industrial plants. Handle men successfully and remember how to sell myself. 771.

Young **engineering graduate** now supervising operation of water gas plant in large city wishes similar employment in smaller community. Has good background of experience in design, manufacture, erection, and operation of blue and carburetted water gas apparatus including automatic grates, charges, and controls, and heavy oil systems. Married. 772.

Manager—Chief Accountant. Twelve years' experience assistant secretary and treasurer; three years' manager carburetted water gas property; excellent record in public relations; thoroughly experienced in new business work; budgets; cost analyses; auditing; will consider either domestic or foreign assignment. 773.

Gas man with twenty odd years' extensive experience is available for duty most anywhere; **operation, distribution, construction** or new business. 774.

Motion Display department. Four years' experience specializing in animating, constructing and installing window and booth displays. Studied design, animation and construction, especially economy in material and upkeep. Can manage department with aide. Location anywhere. Married. 775.

Statistician, technical; specialized in public utility management. Ten years with a company in metropolitan area. Experienced in layouts, installations and history records pertaining to physical properties. Two years' additional statistical experience with a public interstate governmental body. Available September first. 776.

Combustion engineer. Graduate of M. I. T. Age 36. Married. Associated member, A. S. M. E. with nine years' experience in the development and sale of pulverized and solid fuel burning equipment for large steam plants and development and sale of gas producers and burning appliances for industrial application, seeks new connection. Now employed. 777.

Graduate Engineer (47) soundly trained as gas company cadet followed by wide combination gas and electric company experience, up through engineering branches to division manager large organization. Has national viewpoint, could be very useful in holding company or **assistant** to busy executive. Can create and maintain good public relations. 778.

AN APPEAL

A healthy interest continues on the part of prospective employers in some of the advertisements placed by applicants in our **Services Offered** columns. We bespeak the interest and assistance of gas companies, manufacturers of equipment and appliances and all those in need of additional personnel in placing advertisements in the **Positions Open** column.

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